PROBLEMS OF URBANIZATION IN PAKISTAN

TIONAL INSTITUTE OF PUBLIC ADMINISTRATI
KARACHI

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Proceedings of a Conference on Problems of Urbanization in Pakistan

held by

The National Institute of Public Administration, KARACHI

From October 31, to November 4, 1966

Editors

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Dr. Garth N. Jones

The National Institute of Public Administration, Karachi.

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	Chairman	Mr. Hasan Ali Abdur Rahman, Vice Chancellor, University of Sind.
	Discussion Leader ..	Mr. George W. Stevens
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	2. Planning for Urban Transportation.	Mr. Mohammad Abdul Hakym, Assistant Chief, Transport & Communication Section, Planning Division.
	3. Railways and Transportation for Urban Areas.	Mr. Mushtaq Ahmad, P.R.S., Chief Officer (O & M), Pakistan Western Railways, Lahore.
	4. Environmental Safety and Road Transportation.	Dr. M. Sulaiman, Officer-in-Charge, Building Research Station, Pakistan Council of Scientific and Industrial Research, Karachi.

CONCLUDING SESSION

November 4, 1966

2-30 p.m. to 4-30 p.m.	*Resolution adopted by the Conference.*	
	Chairman ..	Mr. Mahdi Hasan, C.S.P., Director, NIPA, Karachi.

GOVERNOR'S HOUSE
LAHORE

October 14th, 1966.

I am glad to learn that the National Institute of Public Administration, Karachi, is holding a Conference on Problems of Urbanization in Pakistan from October 31 to November 4, 1966, to discuss some salient topics concerning the main theme. Such conferences provide an effective and appropriate forum for the exchange of views on vital matters; urbanization being an important problem in the context of our developing and fast changing economy.

Urbanization follows as a necessary corollary to industrial development and goes on increasing with the acceleration of industrial expansion. Pakistan has made great strides in the industrial field, of which we are all proud, but we should not lose sight of our manpower which run our industries. The labour force is drawn mainly from rural areas and they are faced with accommodation and other problems in cities and industrial centres. In fact, housing problem which is allied to urbanization is assuming acute severity.

I hope the Experts participating in the forthcoming conference will review the problem in its entirety and formulate a comprehensive plan to tackle its various facets.

I wish all success to the Conference.

MOHAMMAD MUSA
Governor, West Pakistan.

Governor, East Pakistan.

The 19th October, 1966.

I wish to extend my congratulations to National Institute of Public Administration (NIPA) for arranging this conference on Problems of Urbanization in Pakistan. East Pakistan is still on the threshold of major urbanization. However, the trend towards an era of spectacular urbanization has become more crystallized and magnified since the beginning of this decade commencing with the successful implementation of the 2nd Plan. A major step has been taken for diversifying the economic base of the Province and thereby changing the structure from a predominantly agrarian to a semi-industrialised status. With the blessings of Allah, this process will continue towards the promised goal of making the industrial sector stronger and contributing in a larger measure towards the growth of the national economy during the current Third Five Year Plan.

The concomitant urban growth will be of a much higher magnitude than hitherto experienced. The problems attendant upon such growth are very well known and I hope the conference will identify them adequately and suggest measure to tackle them.

I wish the conference all success.

ABDUL MONEM KHAN
Governor, East Pakistan.

17. Municipal Committee, Sukkur
18. Municipal Committee, Hyderabad
19. District Administration, Gujranwala
20. Department of Military Lands and Cantonments, Government of Pakistan
21. Karachi Cantonment
22. Karachi Port Trust
23. Sind Industrial Trading Estates, Karachi
24. West Pakistan Railway Board, Lahore
25. Water and Power Development Authority, Lahore
26. Karachi Gas Co.
27. Pakistan Atomic Energy Commission
28. Pakistan Council of Scientific and Industrial Research, Karachi
29. West Pakistan Road Transport Corporation
30. University of Sind, Hyderabad
31. Engineering and Technical University, Lahore
32. Pakistan Employees Cooperative Housing Society, Karachi
33. Doxiadis Associates, Lahore
34. Al-Azam Ltd., Karachi
35. Hussain D'Silva Enterprises Ltd., Karachi
36. US AID in Pakistan

Besides delegates from both wings of the country the conference also had four participants from abroad—Professor John D. Gerletti, School of Public Administration, University of Southern California; Professor Ira M. Robinson, Head, Graduate Programme, City and Regional Planning, University of Southern California; Mr. George W. Stevens, Expert, Municipal Management, US AID, Ankara, Turkey; and Mr. Karnandi Wargasasmita, Deputy Director, National Institute of Administration, Djakarta, Indonesia.

Attended by over 200 persons, the opening session of the Conference commenced on October 31 at 10.00 A.M. with a welcome address by Mr. Mahdi Hasan, Director, NIPA Karachi. The Conference was inaugurated by Mr. Qamrul Islam, Secretary, Planning Division, Government of Pakistan.

The keynote address was delivered by Professor Ira Robinson of the University of Southern California.

The first working session was held on the afternoon of October 31 and was presided over by Mr. N. A. Faruqui, Chairman, Capital Development Authority. In addition, Professor John D. Gerletti was the discussion leader for the first session. Each session had a discussion leader who was a specialist on the topic of the session.

The second session of the Conference was held on November 1 under the chairmanship of Professor John D. Gerletti with Professor Ira Robinson as discussion leader. The topic was "Master Plans for Cities."

On November 2, papers were presented on the subject of "Water Works in Cities." Professor A. F. Atwar Hussain, Member, Planning Commission, Government of Pakistan was the chairman and Mr. George W. Stevens, Expert, Municipal Management, US AID, Ankara, Turkey, discussion leader.

The session on "Power in Cities" was held on November 3 and presided over by Mr. Mohammad Aminul Haq, Member, Water and Power Development Authority, Lahore with Mr. George Stevens acting as the discussion leader.

The fifth session on the morning of November 4 dealt with the topic "Transport in Urban Areas." It was chaired by Mr. Hassanally Abdur Rahman, Vice Chancellor, University of Sind. Mr. George Stevens served again as the discussion leader.

Mr. Mahdi Hasan, Director, NIPA Karachi, acted as chairman of the final session held on the afternoon of November 4. This session summarized the Conference discussions and approved the resolutions submitted by the "Resolutions Committee."

Editorial Note

The Conference proved to be an effective device by which to assemble quickly together considerable information; some of which could be obtained by no other process. Thirty papers were prepared for the Conference.

As was to be expected, the Proceedings reveal wide gaps in methodology and subject matter. Nevertheless, they contain a wealth of valuable information.

Since there was little opportunity to explore ideas in advance to the Conference, several of the presentations were somewhat duplicatory. We tried to eliminate the obvious duplications and tie them together in a logical fashion. Considerable editing, rearranging, and rewriting of the papers were necessary. We hope that the contributors will agree with our editorial work.

Before closing, as the editors, we would like to thank all of the contributors to the Proceedings. The contributors, more than anyone else, made for a successful Conference.

Introductory Address

MAHDI HASAN

Urbanized societies represent a fundamental step in man's social evolution. Cities first appeared several thousand years ago; however, in the beginning they were surrounded by an overwhelming majority of rural people and relapsed easily to village or small-town status. The societies of today, in contrast, not only have urban agglomerations of very large sizes, but also have a high proportion of their population concentrated in cities. This is a recent development and has proceeded at a rapid pace. Before 1850 no society was predominantly urbanized; and by 1900, only one—Great Britain—could be so regarded. Today all industrialised nations are highly urbanized and this process is increasing rapidly throughout the world.

Between 1850 and 1950 urbanization increased at a much higher rate than from 1800 to 1850. The rate of this process from 1950 to 1960 was twice that of the preceding 50 years.

In Pakistan the process of urbanization in recent years has increased a great deal. In 1911 in the areas now comprising Pakistan the percentage of the urban population was 4.9; in 1951 it rose to 10.4, and in 1961 to 13.1.

Both the rate and the extent of urbanization vary a great deal between the two wings. West Pakistan is more urbanized than East Pakistan and is experiencing a more rapid rural-urban migration. In 1951 the urban population in West Pakistan was 17.8% as compared to 4.3% in East Pakistan. This difference became more pronounced in 1961 when the urban component mounted up to 22.5% in the former as against 5.2% in the latter. Although the total population of East Pakistan is more than that of West Pakistan, the actual number of inhabitants in urban areas in West Pakistan is much higher (9.6 million in 1961) than in East Pakistan (2.6 million). In East Pakistan, the urban population is increasing at an annual rate of 4.5% whereas in West Pakistan the corresponding rate of growth is 6.1%.

Furthermore, the speed with which urbanization is taking place is much higher than the rate of growth of the rural or total populations. From 1951 to 1961 urban population increased at an annual rate three times as high as the rural and 2.5 times as high as the total population.

According to an estimate of the Planning Commission, the rate of urbanization may rise from the present 5-6% per annum to 8-10% per annum during 1965-70. The Commission also predicts that by 1985, East Pakistan will have a 25% and West Pakistan 45% urban population. The total urban population is expected to be more than six crores; an addition of about five crores as recorded by the 1961 census. The increase in the total population of the country during 1965-85 is expected to be more than seven crores, from 11 crores 30 lakhs in 1965 to 18 crores 60 lakhs in 1985 and two-third of this increase is thus expected to occur in the urban areas.

The great increase in the urban population during the decade 1941-51 was due mainly to the large-scale migration from India; most of these migrants settled in urban areas. During 1951-61 only about eight lakh persons from India came to Pakistan. Most of the increase during this decade reflects the rural-urban migration and the increase by birth; the latter, however, not being the determining factor.

Forces responsible for the rural-urban movement may be divided into two categories: those in the village which "push" the man toward the city and the ones within the city which "pull" him there.

The unsatisfactory condition of the villager is in itself a powerful factor encouraging the migration movement. The extremely high density of agriculturists on poorly cultivated land, indebtedness, the increasing subdivision and fragmentation of holdings, the inefficient modes of cultivation and stock raising, the difficulties in marketing, all make many peasant's life unbearably hard and push them towards the urban areas.

Urban areas provide hope of employment, which not only enables the immigrant to subsist but also enables him to remit some money to his dependents at home. Life in urban centres is less severe and more diversified. Amenities like education, medical care, and recreation, all contribute to the attraction of cities. For the professional experts and other educated persons the opportunity to make more money quickly and the glamour and comforts of city life are additional factors bringing them to large urban centres.

This accelerated urbanization poses a number of problems. Overcrowding and the worsening of the housing situation, the emergence of slums with all their afflictions and baneful effects, squalour, poverty, delinquency, lack of sanitary arrangements, are some of the problems faced by Pakistani urban centres.

It is imperative to get into a state of readiness, to think, plan and provide for the coming flood of migrants. If the needs and requirements arising

out of urbanization are charted out in advance, many baffling problems will not arise with the growth of cities. The main instrument with which a city has to equip itself for being prepared for all eventualities is the master plan.

After preparing the master plan the question of finding ways and means to provide services to the city dwellers arises.

One such basic service needed by all is water. Sufficient, regular supply of hygienic water is a fundamental requirement.

Sewerage and drainage system also occupies a key place in the requirements of a city and creates problems due to increased population of urban areas.

Another basic utility in the cities is electricity, whose value is probably recognized more at the time of its inavailability. The supply of gas continues to assume considerable importance and we also have to plan well in advance the possible use of nuclear energy for various needs and requirements of our urban centres.

Another problem created by speedy urbanization is in the area of transportation. The unsatisfactory road mileage, inadequate public transportation, poor condition of roads, insufficient number of traffic police, the rising number of vehicles of all kinds and of traffic accidents, emission of smoke by vehicles, these are some of the problems to be tackled in urban areas of this country.

This conference on Problems of Urbanization has been organized by the National Institute of Public Administration, Karachi, in order to bring together the administrators, master planners, architects, scientists, engineers, technicians, and others who are interested in urban affairs and to provide them a forum to articulate their views on these problems, ponder over them, and suggest the best practicable ways and means to tackle them.

Leading problems of Urbanization in Pakistan

(Inaugural Address)

QAMARUL ISLAM

The term "Urbanization", simply stated means proportionally faster growth of the urban population relative to the rural population. According to the "Census in Pakistan," every area that has more than 5,000 persons is urban. This is indeed an extremely limited definition. The National Planning Commission, in formulating the Third Five Year Plan, decided that even if we had to limit ourselves to a purely quantitative definition we should not call an area urban unless it had a population of at least 25,000 persons. This is the minimum population which can support certain facilities and services necessary for urban life.

Pakistan is still a predominantly agricultural country with a few urban centres.

If we look at the urban way of life today, it presents a chaotic picture: slums, overcrowding, transport problems, absence or shortage of community facilities and services, and a general sense of frustration. Urban dwellers still speak of "my village" with an unconscious sense of nostalgia.

Pakistan has a rich history and traditions of town building and housing; witness the precise city planning in the Indus valley as well as the zenith of development and status enjoyed by the cities of Dacca and Lahore during the Moghul period. Stable and prosperous rural life also flourished side by side with this advanced urban culture. During the course of time, with political, administrative and economic changes and development, these urban and rural communities became victims of decay and social disintegration. Some of the cities continued growing rapidly and posing serious problems of overcrowding, insanitary conditions and lack of transport facilities. The Municipalities were still in an early developmental stage and could not tackle the complex problems of city administration and development. In the last few decades, government started creating separate statutory bodies called Improvement Trusts and development authorities for bringing about improvements in the cities. The first Improvement Trust in the areas now constituting Pakistan was established at Lahore in 1936. By December 1964

the country had 22 Improvement Trusts and development authorities and 109 Municipalities. Only a few of these Trusts have qualified staff for physical planning and housing.

Since Independence we have undertaken an ambitious programme of economic development in which industrialization figures prominently. As a result of migration of population from the villages and the natural growth of population, the old urban communities face new problems. These urban communities were not designed and were not prepared for the special needs and demands created by rapid economic growth.

The area of local government in Pakistan is still in a developmental stage. Improvement Trusts or Development Authorities rarely undertake systematic planning. Their present functions are generally limited to the acquisition, clearance, and improvement of land. The concept that they should be self-financing perhaps limits their capacity to cater for the needs of the urban communities in a comprehensive manner. It is urgent that the whole sphere of local planning and development should be carefully reviewed and steps taken to change the administrative machinery for more effective administration and rational planning. The Trusts and Authorities should be properly integrated with the municipal government and should be given full responsibility for planning and development of the metropolitan and other urban areas.

According to the 1961 Census, the urban areas are increasing in numbers as well as population. These areas require immediate action. A large majority of the people in them belong to low income groups and cannot afford to own or rent minimum essential shelter. The nation as a whole is too poor to devote necessary resources for the purpose of both improving the standards of housing, water supply and sanitation and increasing the supply of new urban dwelling units at the speed at which urban population is growing. Financial resources at the disposal of the government for physical and social infra-structure are limited and the country lacks some of the physical and technical resources necessary for such a gigantic effort. The strategy of development must achieve a blend of policies designed to ameliorate the immediate hardship where it is acute and simultaneously lay the foundations of a long-range approach which would ensure growth of facilities in future on sound lines. This is of course easier said than done.

The problem of urban development must be tackled in a comprehensive fashion. It is of little use allowing cities to grow haphazardly and then adopt heroic measures for slum-clearance. This will be no lasting solution. Economic and social development has to be closely integrated to a programme of urban development, which has many facets such as development

of transportation, housing, sanitation, education, social welfare, recreation etc. Investment in urban development should be planned as thoroughly as economic development itself. No particular pattern of urban development should be taken for granted on the basis of existing economic development programmes. Detailed studies of the possibilities of location of future economic activities, development of social infra-structure, *e.g.*, power, transportation, etc., and market and other relevant studies will suggest an optimum pattern of urban development compatible with the overall resource position. In many cases, where cities have been already allowed to grow to very large sizes perhaps, nothing radical can be done except to make marginal adjustments for the present and prevent a further aggravation of the situation. But in a great many cases, particularly in the expansion of existing small towns and the setting up of new cities, a satisfactory pattern of urban development for a region as a whole can be evolved. This will need close cooperation of experts in many fields *viz.*, economists, town planners, sociologists, transportation experts, building researchers, public health experts and a close integration between physical, economic and social planning. The economic programme should not suggest a rigid framework for physical planning. Detailed studies on physical planning may well suggest a modification of the existing economic programme which may, in the long run, be more conducive to the fulfilment of the social and economic goals of the nation.

I am glad to report that thinking along these lines has already started. The Planning Commission has recognized the importance of housing, community improvements, land use and transport planning, as well as other facets of the development programme, and has started a new conceptual approach to this problem. The Commission realized that as an accelerated economic development was taking place in the country, vital physical changes were also taking place within the physical environment. It also realized that there was a disproportionate distribution of industry and centres of population; and that it was necessary not only to have a planned direction and distribution of economic activities, but it was also necessary to have a planned direction distribution of construction and investment, based on appropriate physical planning surveys, research, analysis and planning. This approach will naturally demand an effective, systematic and viable programme of regional planning. The fundamental task, therefore, is to formulate systematic policies of population distribution in harmony with the distribution of productive forces and development of natural resources. Within the framework of regional plans, detailed physical development plans will need to be prepared for various urban and rural communities. It is expected that during the Third and Perspective Plan periods these new concepts and approaches will be further developed and expanded.

The Third Five Year Plan has been formulated within this new conceptual approach by making physical planning as a part of national and regional economic planning process. The Plan recognizes the causation of physical planning problems by economic development, and, suggests approaches for formulating systematic policies of population distribution, in harmony with the distribution of productive forces and development of natural resources. Within such a frame of reference, it is intended to develop a strategy of overall physical planning. The idea may be illustrated by a general example. Economic development has concrete manifestations in space, as it involves changes in activities and their spatial relationship. Establishment of an economic activity, say a factory, entails parallel investment in public utilities, roads, transport facilities, houses, sanitation, schools, hospitals, etc. As in many cases these investments are not seen as an aggregate or coordinated by a physical plan, the total capital requirements are usually under-estimated, and, hence, the physical environment starts to deteriorate. The establishment of a factory should normally contribute to economic growth. Since the physical planning aspects and investments are not coordinated with this economic activity in advance, it does not necessarily bring welfare and development of desirable physical environment.

The Third Five Year Plan recommends a number of clear-cut policies and envisions important new departures, demanding bold and imaginative action. For the first time the Plan focuses attention on both the regional and local problems and adds therefore, a regional dimension to the development programme. The new institution of "Basic Democracies". will be duly integrated in this approach, and the Plan provides for a more extensive and intensive utilization of the potentialities and resources of the people themselves for achieving regional and city planning legislation as well as create suitable administrative machinery for regional and city planning and development. As a first step in this direction, a unique project in East Pakistan has been launched in September 1965 with the help of the United Nations Special Fund. The United Nations Special Fund has agreed to assist the Government of Pakistan in the preparation of an overall Plan for the physical development of East Pakistan within the framework of national and regional economic development policies, objectives and targets.

The Government of East Pakistan has recently created an Urban Development Directorate within its Works Department in order to guide the existing and future urban development of the Province along scientific and systematic lines. Although this Directorate is located within the Works Department, because of the nature and scope of work of the Directorate the Government has also created an Urban Development Council under the chairmanship of the Additional Chief Secretary (Development). The Council is composed of Secretaries of all the related departments as well as

heads of other related agencies and institutions. The Urban Development Council will provide leadership and guidance to the Directorate for all policies and plans of existing and future urban development of the Province. The Council shall advise the Government on all matters related to urban development as well as the Special Fund Project for location and planning of new cities in East Pakistan. The Directorate will serve as the Secretariat of the Council. In addition to the present duties, it is also contemplated that this Directorate may be represented on the existing Central Land Allocation Committee and that the Provincial Planning & Development Department may also consult this Directorate for all those development schemes and projects which have a direct relationship or bearing on urban development in the Province.

Along with this work the Project will also present to the Government clear-cut proposals for organization of an effective and appropriate Urban Development Institution for the Province as well as appropriate legislation for guiding and controlling the physical development of the Province.

Efforts are also underway to initiate a project for Regional Development of Peshawar Valley, prepare a self-help project for Comprehensive Development of a depressed region, and Urban and Outline Development Plans for important Urban Centres.

The Third Plan also stressed the need for relating the distribution of population and facilities for living with the growth of economic activities and employment opportunities within a regional framework. This will remain a pious hope unless appropriate practical measures are taken for regional and city planning in both wings of the country and suitable administrative machinery for preparing and implementing regional plans is provided.

One of the most intriguing features of urbanization is that it disintegrates the natural cohesiveness of the rural living conditions, brings the disintegrating individuals together in a new environment and then seeks ardently to create a community out of them—more or less artificially, in the hope that the forces which have compelled these individuals to disintegrate would impel them to get 'knitted together' in a more effective and socially productive pattern. Since this 'knitting together' is of "humans by humans," it requires something more than science and technology to bring about proper synthesis. If the incentives, which came into play at the time of disintegration, were material in character, the new or the additional cementing incentives will have to be of a different character and may have an admixture of more emotional than rational components like pride, fellow feeling, sympathy, mutual regard, etc. Besides the technical and other administrative difficulties, such programme for urban areas will pose many challenges which have

not so far been met. There is substantial urban unemployment which could be usefully utilized for improving slum areas, building low cost housing, developing community parks and other community facilities as well as constructing important community structures. This unemployed or under-employed urban labour force, however, is at a high level of despondency. The key challenge to the Government is: Can the latent energies of these people be mobilised in the same manner as the Rural Works Programme?

The villages, with all their economic and social backwardness, still provide a certain spirit of community or a general sense of belonging and mutual responsibilities not always to be found in the urban areas. Various types of natural calamities or a crisis situation further strengthens this mutual bondage of the rural people. As such the people of the village generally act in unison when there is need for community action. During the process of urbanization, when these rural immigrants become industrial, commercial or white-collar workers, they go through such a frustrating phase of adjustment to the new unsystematic and hostile urban environment that many of these traits of cooperation, community action and an optimistic belief in the final results of such an action are slowly subordinated to their sheer struggle for survival. Accordingly for these lower income groups the new environment is hostile and the urban society in particular is a perpetual menace. Villagers tend to congregate and dwell together when they migrate to the city for very sound economic reasons. Individually they have very little security in the new urban environment, since the city itself is not yet highly enough organized to offer them a replacement for the traditional system they left behind in the village. In addition to the problems the migrant finds in adapting himself to a new physical environment, he must also develop new skills, he must learn to live with automobiles and traffic rules, he must understand a new system of law and order. If these problems are further complicated by forcing him to live in an environment which does not cater to his needs, then his assimilation into the urban pattern is virtually impossible. If the new urban dweller finds none of the old institutions with which he is familiar, if he is obliged to live away from his place of work, if his wife must go far to find water, if his children have no fields to play in, then his existence becomes increasingly miserable.

If the difficult problem of the integration of the former rural inhabitants into an urban society are sufficiently realized by the planners, then they will be forced to seek solution which cannot be found in any textbook on town planning. New solutions must be developed which take into consideration the particular aspirations and tradition of the people. Perhaps the answer lies outside the city in the rural environment itself. Perhaps a new type of town should be developed: a town which is neither entirely urban nor entirely rural, a town which is midway between the village and the city and

can absorb the overflow from the land without forcing the people to change radically their mode of existence. It must not be thought that economics alone should determine the pattern of development. There are many cases where immediate economic considerations must take a back seat to long range planning objectives. Unless this is realized, I am afraid that the new development may turn out to be a nightmare instead of utopia.

Urban development is one of those phenomena which requires the support of the people more than any other programme. This is so because at the present pace of urbanization, especially in the developing countries, no government or any other public organization can be rich enough to meet the full financial needs and the ever-increasing cost of such programmes. Since the participation of the people in these programmes is a must, the ways and means of enlisting their support should be explored.

My intention was merely to bring to your notice the problem as I see it and to provoke you into thinking and suggesting possible and practical solutions for it.

Comprehensive Regional Physical Planning: A Sound Pattern of Future Urban Growth in Pakistan

IRA M. ROBINSON

What I propose to do is review and summarize the major conclusions that other experts have arrived at regarding urban trends and problems in Asia, including Pakistan, and suggest some possible implications for urban and regional planning. In particular, I will make a plea for developing nations to plan the future pattern of their urban development and for such planning to be realized requires close coordination between national economic and social planning, on the one hand, and local development planning on the other, within the context of a comprehensive regional physical plan.

A. INTRODUCTION

Throughout the world, three different types of planning have gained acceptance and influence in recent decades: national economic and social planning, regional development planning, and local city or metropolitan planning.

In the field of national economic policy and planning, the "developing" countries have developed concepts and approaches appropriate to their own special needs and conditions and quite distinct from those being used in the so-called "advanced" countries. But at the regional and urban levels, the less developed countries still tend to follow Western precedents by and large, at least in terms of general principles and procedures. This means that region-wide development programs are seldom related to urban problems, while city and metropolitan planning efforts are carried on quite independently, as a rule, by local governments and by a group of specialists who have little working contact with broader programs or policies.

In Asia, however, there is increasing evidence that urban development problems reflect a special set of conditions. And it may be that an entirely new type of regional planning is required, to relate national social-economic policies and various physical development programs to a sound pattern for future urban expansion. This, incidentally, is not a new idea; during the past ten or so years, a few experts have called for this type of approach to

planning in developing nations.[1] The idea has evolved gradually from two concerns: (1) the rising interest in urbanization—its causes, effects, and solutions; and (2) the realization that economic and social development has implications for, and in part is dependent on, physical development.

The Rising Interest in Urbanization: Importance of Physical Development

Until quite recently, the impact of urban growth in developing countries received very little systematic attention from either the social scientists or the policy makers. Within the past ten years, however, a considerable body of expert analysis has begun to accumulate, on urbanization as an inevitable corollary of development, also on its causes, social-economic effects, and policy implications.

Led by demographers and other social scientists, this work has helped to provide a broader understanding of development dynamics in Asia. Earlier, a tendency to view economic and social issues independently had resulted in many unresolved conflicts. Artificial barriers were likewise frequently evident, in the treatment of resource development, industrial expansion, village betterment, and urban improvement as separate questions, to be handled by separate policies, agencies and specialists with little coordination. But the focus on urbanization cuts across "social" and "economic", and helps to set the various specialized program within a broader frame of reference which emphasizes their interrelationships. Moreover, it poses the problems not as abstract generalized issues, but in dynamic three-dimensional terms: population movements and future distribution; the effect of physical environment on productivity and social progress; the location and structure of urban-industrial growth. In short, economic development has concrete manifestations in space, as it involves changes in activities and their spatial relationships.

Such a focus naturally leads to greater emphasis on physical planning, in regional as well as urban terms, and to the need for coordinating economic and social plans with physical plans. The planned allocation of resources in space—that is, physical planning—is a necessary element of development planning. Economic development plans allocate resources to industrial investment, to social infra-structure, to housing and to non-residential construction, but these decisions are often not coordinated with those of the physical planners who are concerned with the *where* and *how* of building these facilities.

[1] The most notable perhaps being the late Mrs. Catherine Bauer Wurster, who at the time of her untimely death, was Professor of City and Regional Planning at the University of California, Berkeley. See, for example, her article "Economic Progress and Living Conditions" in the British Journal, Town Planning Review (1954).

The need to coordinate economic and social planning with physical planning and to relate these various types of planning on a regional, as well as an urban and national basis, is a lesson I thought developing nations would have learned since World War II, as the result of their experiences with carrying out developmental planning. Yet, if I read the signs correctly, I am afraid this is not so. In reading a wealth of literature on planning in developing nations, including Pakistan—in preparation for my participation in this Conference—I was appalled by the fact that it seems like "business is going on as usual"—the same emphasis on economic development and planning, and not physical (or spatial) planning—and the absence of regional planning.

My objective today will be to try to bring this problem once again back into focus and perspective—to re-emphasize and underscore the need today —more than ever—to plan the future pattern of urban development; to develop a planning process and structure which places physical (or spatial) planning on *equal* footing with economic and social planning, and which recognizes the potential role and value from *regional* planning, in addition to urban and national planning. And, while I will be talking about Asian countries in general, I will always have Pakistan in mind in making my observations, and, indeed, where appropriate, will make specific references to Pakistan's situation.

B. URBAN GROWTH IN ASIA: PROBLEMS AND PROSPECTS

The issues that stimulated the fairly recent study of, interest in, and concern for urbanization cover a wide range: from social welfare and psychological adjustment to industrial decentralization and the capital to be invested in "social overhead". But the basic issue in most cases has been the evidence of ever-increasing squalor, congestion, social disruption and economic inefficiency in the metropolitan centers, and a deep concern as to what can be done to remdey these evils.

1. The Expanding Metropolis: Unsolved Problems

The urban/metropolitan problems facing developing nations are documented in numerous lengthy reports, and I need not detail them here today. Based on your own experience, I am sure that you would agree as to the general picture: that physical living standards for the vast majority are extremely bad by any standard, worse than in many primitive villages; that crowded unsanitary housing (or no shelter at all) plus inadequate urban services, tend to enhance ill health, social demoralization, broken families, unstable employment, productive inefficiency, and political unrest; that there is much unemployment and in any case higher cash wages do not in general mean a better life for the urban worker than the rural worker;

that all these conditions tend to be worst for recent immigrants to the largest cities; but that nevertheless the great centers continue to have the highest growth rates, which probably means that the situation is getting steadily worse despite numerous costly remedial efforts; and that therefore in many ways the urbanization process in its present form may be a hindrance rather than a help to both social and economic progress.

As a result, most Asian countries have been actively concerned with potential remedies and alternatives for some time. Can enough capital resources be devoted to urban/metropolitan improvement, along with more effective city planning, to reverse the downward trend? If not, can the tide of in-migration be stopped or slowed down by rural development? Is industrial decentralization desirable as a general policy? Under what conditions and by what means should industry be promoted in satellite communities, new towns, existing smaller cities, or groups of villages?

Or on the other hand, would decentralization really be cheaper and better New towns built completely from scratch have often been quite expensive. Entrepreneurs and skilled workers seldom want to live in primitive or isolated communities. Moreover, the total impact of city life is far from being only a negative one. After all, it is the city which has paved the way for the great achievements of Western civilization. It is in the city that man has achieved his highest levels of living and greatest intellectual and artistic triumphs. Is the great metropolis such a unique and historic breeding place for dynamic enterprise, innovation, modern social values and working habits that its growth should not (or could not) be curtailed, whatever the attendant difficulties? Indeed, is a long period of urban misery, disruption and inefficiency merely "the price of change", which all societies must inevitably pay in the course of modernization?

Many economists and demographers have argued the latter view, but few if any Asian planners and policy-makers have accepted it. Efforts and expenditures to improve conditions in the large cities continue to mount. Also, there is widespread agreement concerning the desirability of decentralization; the Governments of Burma, Ceylon, Hongkong, India, Indonesia, Philippines, Singapore and Pakistan having generally accepted this principle as one of the bases for housing and city planning.

Various measures and experiments have been tried, sometimes following Western models. Many conflicting philosophies have been debated. But no generally effective answer has been found. Moreover, it is only in terms of the basic conditions of Asian urbanization, just beginning to be understood, that any successful policy can be evolved.

2. The Conditions of Urban Growth in Asia: some Implications for Planning

Several factors tend to make urban problems and possibilities in Asia quite different, in essence, from those in Europe or America, and likewise call for different solutions.

a. *Extremely limited resources for "social overhead"*

Developing countries have always faced the problem of extremely limited resources for "social overhead" to some degree, but it has never been as critical as in Asia today. Population will grow at an unprecedented rate in the next few decades, because relatively simple public health measures now reduce the death rate sharply, while the birth rate reflects the level of education and comes down very gradually. Moreover, there are no empty continents available for settlement by surplus population today, as there were for 19th century Europe. Most Asian countries, living largely at a bare subsistence level and already crowded, are therefore confronted with a race between increased population and increased productivity. Hence industry and agriculture must get first priority for the investment of scarce capital.

At first, in view of this situation, most economic planners and economic development experts were simply opposed to any large-scale demands for better housing or social services, on the ground that the limited supply of steel, concrete, skilled labor and cash could not be spared at this time for expensive consumer goods. They tended to discourage ambitious schemes for large scale housing or long-term civic improvements in favour of investments likely to bring more immediate and tangible economic returns. From their viewpoint, even a tremendous increase in international assistance could hardly change this picture, so serious is the need for a rapid rise in production. But gradually it came to be recognized that living conditions could not be ignored, whether in social, economic, or political terms.

The question then became how to get maximum benefit from improvement outlays. And it was found that with technical guidance certain special types of resources might advantageously be used for housing and related civic needs: unemployed or under-employed labor, frequently unskilled; cheap local materials too impermanent for more exacting use; and personal investment. Such methods reduce not only the capital investment but also the need for outright subsidy. For in Asia only about 10-15% of urban households can afford even a tiny $ 1,000—$ 1,500 dwelling, the minimum cost by and large when modern building materials and methods are employed.

The difference between this set of criteria for home production and those prevailing in advanced countries need hardly be stressed: labor-intensive methods versus labor-saving technology; maximum savings and

personal labor from occupants instead of maximum credit; and (strangest of all to Western-trained architects and planners perhaps) cheap impermanent materials instead of durable low-maintenance structures.

The implications for planning are equally obvious. Such criteria, along with similar principles for sanitation, transport, and other basic services, can hardly be applied successfully in large congested cities with high land-values. Relatively low density would be essential for this type of "resource-saving" improvement policy. For there is little question that the cost of minimum standard housing and services tends to rise with density and city size. The available studies of Asian cities indicate that the price of a multi-storey tenement in the central city(including land cost)is likely to be between 3and 6 times as much as for equal or better accommodations in an outlying su burban location, and the cash cost of the latter could probably be as much as halved if the owner contributed labor. However, an obvious word of caution is in order: This saving in home construction, might be eaten up in additional transport costs (or lack of employment opportunities) *if* this kind of housing were built far out on the metropolitan fringe and *if* most of the jobs continue to be available only in the central districts. Indeed, it is not surprising that thus far, the "aided self-help" experience has been mainly in village development programs. Its adaptability to urban problems is just beginning to be explored and tested.

The "social overhead" issue clearly favours some form of decentralization that would permit very simple construction, sanitation and transport, with maximum self-help, together with adequate job opportunities and a healthy economic base in the decentralized communities.

b. *Over-urbanization and over-concentration*

Another important conclusion from the studies of the social scientists is that Asia, although still predominantly rural, must be considered "over-urbanized" at present. That is, if the experience of Western countries is used as a standard, many of the nations of Asia today have a larger urban population than is justified by their degree of industrialization or general economic development, as measured, for example, by the proportion of their population engaged in non-agricultural occupations. In terms of employment in productive industry, the gap is still greater, as the high proportion of urban "service" jobs in Asia is a reflection, in part, of economic lag, not of progress as in the West.

The reason is clear enough. Urban growth in Asia tends to reflect more the "push" of desperate necessity from increasingly over-crowded rural areas, than the "pull" of bonafide economic opportunity in cities. Meanwhile, political refugees have further swelled the cities in many countries.

UNESCO studies of urban in-migrants in several Asian cities "do not suggest . . that the attraction of 'city lights,' is very strong . . Economic hardship in varying degrees was the real reason for practically all migration." Few had achieved industrial jobs, or even regular support. The result tends to be either "floating migration . . interminable wanderings in search of a living or what could pass for it", an equally unsettled "to and fro" movement between village and city, or at best a mere transfer of rural mores and associations to the city, which becomes in large part an "agglomeration of villages", only infinitely more crowded and in many ways more insecure and unhealthy.[2] Broken families and a considerable degree of demoralization are a likely accompaniment. Socially, therefore, this movement reflects little of the dynamic change traditionally associated with urban migration, except perhaps as a rather dangerous and uncertain form of shock-treatment.

Another dimension is added to this picture by the fact that urban expansion tends more and more to be concentrated in great metropolitan centers. Judging roughly from the UN Demographic Yearbook and some later estimates, Asia now has 35 to 40 metropolitan areas of over a million compared with a mere handful before the war. Something like 70 to 80 million people live in them, or more than half of the total population in cities over 100,000, and their present rate of increase is usually at least twice as fast as that of smaller cities. The situation in Pakistan, as you are all well aware, is similar: In 1961, 56% of the total Pakistan urban population was concentrated in the 16 largest cities of 100,000 population or more (compared to 53% in 1951). And while these 16 major cities grew by 64% between 1951-61, those cities and towns with less than 100,000 people grew, in total, by only 46%.

Moreover, many of these metropolitan centers were colonial creations, or at least the product of economic development oriented essentially to one or more foreign countries. They are now centers of nationalism, frequently capitals, but they often have a large foreign population and still function mainly as a link between the local elite and the outside world rather than an economic outgrowth of the indigenous national economy.

There is a great gulf, cultural as well as economic, between the metropolis and the rest of the country, and also between the elite and the rural immigrants within the community.

The great city in Asia, therefore, unlike its counterpart in the more developed areas of the world, may be a barrier to, rather than a product of,

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[2] *The Social Implications of Industrialization and Urbanization* (Calcutta, 1956).

economic development. The concentration of people and resources in primate cities may serve to inhibit the growth of medium-sized cities more strategically placed for the development of various industries.

What are the implications for planning? Metropolitan centers are necessary for certain functions at all stages of development, but it would appear that from any practical viewpoint Asia is already oversupplied with such centers. The basic need is for better distribution of future urban development, not only for improved efficiency and welfare within cities, but also for a more effective bridge between city and country.

The arguments for some form of decentralization are thereby further enforced. But this will not happen automatically. The fact that the big cities exist creates a tendency for further centralization of industrial, commercial and service development. (There is a familiar adage applicable here: "Nothing succeeds like success.") More people are then attracted, who create more problems, hence more pressures for additional employment, housing and services. This mounting cycle of concentration can only be broken by the establishment of powerful new magnets elsewhere, at a scale commensurate with the rate of urbanization. But this means a very strong and comprehensive public policy and program: a few new towns and some rural industry here and there will have no visible effect.

c. *The tremendous scale of future urban growth*

Despite the number of large cities, Asia is still in an early stage of urbanization, with the big push yet to come. The total population is expected to increase from 1.3 billions in 1950 to roughly 2 billions in 1980. By projecting only a moderate increase in the proportion of urban population to the total, Dr. Philip Hauser estimates that by 1980, residents of Asian cities of 100,000 or more may considerably more than double, increasing from 106 million in 1950 to 266 million. He made no projections for cities over a million, but on the same basis they might be trebled in size if the rate of urban concentration continues.

Moreover, these projections may be quite conservative, since they assume that most of the 700 million additional people will remain in rural areas and small towns, increasing *their* present population by about 40 percent. Since these areas already tend to be heavily overcrowded in relation to agricultural opportunities, an enormous increase in nonfarm employment would be necessary to support the additional population, an increase that would probably also require a comprehensive program of industrial decentralization. And any such program would itself bring considerable urban development in one form or another.

Your Pakistan National Planning Commission estimates that by 1985 the urban population in Pakistan will reach 60 millions, or 31% of the projected total population at that time. In a special background paper prepared for this conference, my colleague at USC, Mr. Arthur Atkisson, comes up with an even more formidable set of numbers for Pakistan based on a longer-term projection: Using a 100-year time span, he projects a total urban population of some 140 million persons by the year 2061 (an increase of 128 million over 1961), this urban population representing 70% of the total Pakistan population.

Employing somewhat similar procedures and assumptions, Dr. Richard Meier comes to comparable conclusions for developing nations as Mr. Atkisson did for Pakistan. Dr. Meier wrote:

> The land itself needs the help of only a small fraction of those now residing upon it in order to bring forth its maximum bounty. The excess will need to move—to the mines, the construction camps, and the cities. Eventually, it can be shown, 70 to 90 percent of the population will need to be urbanized. This movement looms in even more massive proportions when it is realized that the percentage refers not to present population, but to some future total very likely two to three times as large. Any long-range plan for development that does not recognize and deal with this tremendous redistribution of population is doomed from the start . . . The cities, it will readily be seen, must expand and grow as cities have never expanded before . . . All methods [of estimating their probable size] suggest a very strong pressure for at least some aggregations to become an order of magnitude greater than the metropolis—the population of the largest of these would be numbered in tens of millions instead of mere millions.[3]

Whatever the precise figures may be, such estimates should, at least, force the planner to take the implications into account as fundamental ingredients of any 'plan' for the areas with which he is concerned.

d. *New opportunities*

The scale of probable urban growth is dramatic, and it may well be frightening, since the urban environment apparently plays such an important role in the development process, whether for good or ill. But the impending urban flood also presents an opportunity unique in history. For it means that *the pattern of Asian cities is not yet set.* This is clear when we realize that the projected increase in Pakistan's urban population by 1985—an additional 44 million urban dwellers—means that you will be building over the next 20 years another 17-18 cities the present size of Karachi. And, if we take an even longer view, as Mr. Atkisson did, then you will be building over

[3] Richard Meier, *Science and Economic Development* (1956), pp. 171, 172.

the next 100 years the equivalent of 100 new cities of 1.3 million population each, or, as Mr. Atkisson prefers to describe it, approximately 40 new cities of 3.14 million population each. In view of the magnitude of the urban growth yet to come, the real urban challenge facing Pakistan (and other Asian countries) is not in what our urban centers have become, nor in what they might have been, *but rather* in what they might *yet* become.

Not only is most of your urban expansion and economic development still to come, but more importantly perhaps, the range of alternatives available today may be much greater than it was for Western countries in their initial period of population, industrial, and urban expansion, the period that established basic development patterns and created problems that are by no means wholly solved, a century later. There are at least two new factors which make it unnecessary to repeat the costly mistakes of the past. One is the fact that present technology offers a wider range of possibilities for the region-wide distribution of population and for structure of communities than was possible in the 19th century. The other is the *increasing role of* government and public responsibility in the planning and development process.

A modest application of advanced technology, *if* applied with selective imagination at key points, may make it possible to stimulate productivity in backward rural areas without an intermediate "paleotechnic" era, and to develop adequate cities and towns on the basis of cheap building materials, unskilled labor, and very simple services. But although the basic scientific knowledge may come from the West, the form of its application will be entirely different. In his book from which I quoted earlier, Dr. Meier offers some bold and creative ideas on entirely new urban patterns for developing nations based on application of certain of the new and emerging technologies of the West.

Meanwhile, the acceptance of public planning should make it much more possible than it was in the formative period of Western urbanization, to guide development toward a more desirable urban pattern. Not only is national economic planning fully accepted and well developed, but also the basic decisions and expenditures that actually shape the urban-industrial pattern, whether consciously or unconsciously, are largely public: resource development projects, transportation and utility lines, etc. But there are two important qualifications. As with technology, entirely new types of planning "application" may be required. Also, the assumption of public responsibility (as against relying wholly on the automatic adjustments of the market) brings with it the need for a high degree of understanding, to provide a sound basis for developing appropriate planning criteria. Otherwise, the results may be worse than from *laissez-faire*.

C. THE ASIAN CHALLENGE: *Planning the pattern of urban development*

The present metropolitan problems cannot be ignored. But if the urban population will soon be several times larger than at present, and if city size, density, structure and location have important effects on costs and other elements in the urban environment, then the critical issue is the distribution and organization of *future* urban growth. And if enormous agglomerations are to be avoided in favour of some better pattern, then it is necessary somehow to divert the flood before it reaches the present large cities. But this is a much broader and more dynamic view of urban planning than has ever been generally accepted or practiced in the West. And this difference may help to explain the fact that though there is sufficient recognition of the dangers of the growth of large cities no serious steps as such have yet been taken to arrest this development, for in general, Asian city and metropolitan planning has followed Western models. But it is absolutely necessary to develop new planning techniques, to fit the urban situation in Asia.

1. The lack of Western precedents

In Europe and North America, industrialization and urbanization have been going on for more than a century. And although the future will bring many changes and adjustments, the basic pattern has been pretty well set for a long time.

Only remedial planning is therefore possible, by and large, however heroic and costly it may be in many instances. For essentially Western city planning is a question of *re*-development, *re*-organization, and *re*-location, not of providing for hundreds of millions of *additional* urban dwellings and jobs as in Asia. Even where "decentralization" is a major public policy as in Britain, this only means the creation of a few satellite cities to accommodate the "overspill" from old congested central areas, not guiding a great flood of migrants from rural communities to their initial experience with the urban-industrial world. Under such circumstances, urban planning is almost wholly, and quite naturally, the responsibility of existing local governments. And in the United States when the cities overflow into the hinterland (due to the desire for lower density living much more than to growth *per se*) the main issue is how to get unified public control and planning for the metropolitan area. In the few regions where urban growth is still rapid (notably the West Coast of the United States) there is little pressure to develop an "optimum" urban pattern, partly due to inertia, but mainly because the economy will support a great deal of waste, and an endless succession of expensive remedial measures (a network of super-highways, for instance) to keep things going with reasonable comfort and convenience, however irrational the basic pattern.

Meanwhile, most Western countries also engage in some form of national economic planning today, and, in addition, there are resource development projects, highways and other big public works, at the regional level. But as a rule these activities are entirely separate from city planning, and little concerned with their potential effect on population distribution or urban growth patterns. In the whole world, only in two small countries with rather special local conditions, Netherlands and Israel, can it be said that either national or regional planning has been systematically concerned with overall population distribution and the pattern of urban development.

All of this means that the West provides few precedents for the kind of knowledge and research method required for urban planning in Asia. Western and Western-trained planners know very little about desirable city size, structure or location for various types of economic activity, or for maximum social benefit and civic economy, because they rarely have had to make such decisions. For when the pattern was originally set, there was no planning.

2. The Factors that will Shape the Future Urban Pattern

All kinds of locational decisions and background forces are involved, of course, in shaping the future urban pattern, including: individual movements for variegated personal reasons; business determinations resulting from market judgments; but above all perhaps, in Asia today, a wide range of public decisions and activities. In this paper, only some of the main factors can be briefly noted, but in particular, I will suggest the important role of public judgments and policy, with respect to these factors.

a. *The migrant drift: primary or secondary factor?*

It can be argued that the present trend toward concentration is caused primarily by the movement of people to the metropolitan centers. But the migrants move from rural areas only to find subsistence elsewhere, winding up in the metropolis because this is where new economic activity is mainly centered at present, or where the migrants think jobs are available (and, as a result, this may only mean a better chance for charity or marginal service employment). If equal economic opportunities were available elsewhere, there is every reason to believe that the migrants would seek out these other communities.

b. *Industrial location*

Economic factors and market judgments must always be of primary importance in the location of industry, whether private or public. But although some types of enterprise require the "linkages" made possible by large cities, a great many industries (from some of the most advanced down

to traditional handicrafts) can function equally well if not better in smaller communities. The fact that several Asian countries, including Pakistan, control new industry through a licensing system therefore provides some real leeway for encouraging one type of location over another. Essential to practically all industrial enterprise, however, are the services and utilities termed "economic overhead" or "infrastructure by" development economists and planners.

c. *The distribution of urban improvements*

What the economists call "urban infrastructure" includes not only housing, schools, and health facilities ("social overhead") but also the network of transportation, utilities and services required for city life. Much of the capital investment and subsidy needed for such benefits comes from provincial, state, or national governments in Asian countries, and the distribution of these expenditures is therefore an important factor in the evolving urban pattern. If most of the improvements are located in the great metropolitan centers (as they often are because the need there is so obvious), they probably tend in the long run merely to attract more people, and so on and on around the endless circle of worsening problems and ever more expensive amelioration. If the limited resources available for urban improvements were instead more widely distributed in accordance with an overall urban planning and development policy, they might have the opposite effect. And they might at the same time produce more lasting benefit, at relatively lower cost.

d. *Regional resource development including river valley projects*

Some industries must also be close to raw materials, which are frequently developed by public initiative, directly or indirectly. Of particular significance for urban-industrial growth are the great river valley schemes, because they are likely to involve both cheap power and intensive agricultural development by irrigation. Here is where the opportunity for comprehensive regional planning is most obvious. The regional approach can check the powerful trend of population toward unbalanced concentrations in the big and overcrowded towns and provide for a more balanced economic and social life in the geographically characteristic region-units. This regional trend is greatly facilitated both by modern transport methods and by the experience with the planning of watershed projects which allow country-wide irrigation and easy power transmission for the industry of a region.

e. *Rural and village development*

The village development movement, a major aspect of national policy in most Asian countries, can affect urban structure in two different ways: by slowing down urbanization, and also by creating new towns or expanding

old ones in rural areas. Along with social and cultural improvements, location of industry within existing clusters of villages might bring to the rural population direct benefits. The usual drift to the immediate vicinity of the production centre might possibly be reduced. In this way perhaps a more desirable mix between central planning and individual and group initiative also could be achieved. However, the increasing emphasis on competitive, somewhat modernized rural industry rather than subsidized handicrafts is likely to transform many of these village clusters into bona fide towns. Increased rural prosperity would also strengthen existing market towns in the neighborhood. This would result in a more evenly distributed system of urban places. But it also means that village development policy cannot be divorced from urban and regional planning.

f. *City and metropolitan planning*

Local planning by itself can have little effect on great population movements or industrial trends. An arbitrary growth limit on population established on paper in a metropolitan plan is likely to be quite futile in Asia, or anywhere else for that matter. Metropolitan in-migration is like a flood, which can only be controlled, guided and diverted from the source or somewhere upstream. This does not mean, however, that local planning *per se* is unimportant. Quite the contrary: it could begin to be effective if it were related to broader urbanization policies at the regional and national level. Moreover, no one imagines that metropolitan growth can actually be stopped by even the most comprehensive program for better urban distribution. Indeed, the promotion of satellite communities would probably be part of such a program, and this would require very carefully considered expansion plans for the metropolitan centers.

Detailed expansion and improvement plans would also need to be prepared for smaller cities and towns scheduled for industrial development and additional population. Entirely new communities, however, or towns that might develop from village clusters, would probably have to be planned at the regional or provincial (state) level, at least in terms of key initial elements and broad land use determinations. But in all cases, some degree of coordination and agreement between local government and regional or national agencies would be necessary, with respect to the industrial and population potential of the area, the provision of essential services such as highways and power, and any assistance required for housing or other civic facilities.

3. The lack of coordinated Policies

Clearly, public actions and decisions already play a major role in shaping the urban future, whether consciously or unconsciously. Moreover, the above list reflects only the more tangible and direct factors. The influence

of other development policies such as tax policy, public expenditure policy, foreign trade policy, wage policy, etc., on the location pattern of industry should be borne in mind as well. This high degree of public intervention likewise means inherent public responsibility for the resulting pattern. *Over-concentration may be less the result of "market" forces than of short-sighted or uncoordinated public decisions.* And, judging from my cursory review of the literature on Pakistan's planning, including the three five-year plans, this appears to be exactly what has been happening here. There appears to have been a complete absence of coordination between national economic policy and planning, *e.g.*, with respect to industrial location, and policies with respect to housing and urban infrastructure. Indeed, these policies have been at cross-purposes. On the one hand, the government has established a policy of industrial decentralization. On the other hand, the bulk of new housing and investments in urban infrastructure (*e.g.* water supply, sewerage treatment facilities) have gone into the major centers, especially Karachi, Lahore, Dacca and Chittagong. This has resulted in attracting more people (and, in many cases, more industry and business) which is the very thing the government supposedly wanted to avoid. Moreover, even the policy of industrial decentralization has been fraught with inconsistencies. For example, the Directors of Industries in West and East Pakistan who, under a 1963 Act, were given the power to license industries for specific locations, can not pass on the location of enterprises sponsored by various national and provincial authorities which, in practice, makes them virtually powerless to develop or enforce a locational policy. The proof of the inadequacy of this system is the fact that between 1959 and 1963, a large proportion of the licenses issued were issued for Karachi, Dacca and Chittagong, which only aggravated the already existing trend towards concentration in these areas.

4. Need for a regional focus in planning and research

Clearly, if urban growth is to be guided in the public interest, many different types of policies and programs are involved at all levels of government. But it would seem to be *at the regional level* that the key elements could best be fitted together into some kind of physical plan for urban-industrial development. "Regional planning" is a term applied to many different programs, but these programs tend to share some common principles and purposes. In the first place, they all tend more and more to involve some degree of coordination among different types of public decisions and policies. *e.g.*, highways and multi-purpose water projects are developed in conjunction with new industry and improved agriculture.

Also, these regional planning efforts have tended to bring new emphasis to comprehensive planning for *physical* development. Approaches, methods and techniques are needed to cope more effectively with rapid change in the settlement pattern and to achieve a more balanced development

through planned location of industry in relation to other fields of production. Physical planning in step with economic and social programs thus would become an essential factor influencing balanced development.

And finally, regional or provincial programs for area development should be viewed as a necessary bridge, translating national policies (often unavoidably abstract or specialized) into tangible local improvements and comprehensible benefits. The region, in this sense, is the link between the individual community and the nation. A regional plan offers an easier identification of national goals in terms of local action.

a. *The needed powers and administrative machinery.*

Within the present framework of planning and administration, however, what I have just been arguing for is clearly easier said than done. Perhaps the real obstacle lies not so much in any disagreement as to the theoretical logic of regional planning for urban growth, as in a feeling that it might be too difficult, or require too much centralized power.

One difficulty is the gulf between "economic planning", carried on mainly at the national level in terms of quantitative analysis and specialized policies, and "city planning" which tries to cope with community problems *after* the basic development trends and decisions have established the pattern. In this "no man's land", urban and industrial growth, through regional planning, is clearly needed. But, this requires breaking down established ways of thinking and doing things, on the part of all concerned.

Admittedly, any entirely new form of public responsibility is likely to be difficult at the start. And it is true that many developing countries have a serious shortage of trained personnel and seasoned experience (as well as weaknesses in effective democratic participation), with resulting dangers of "over-planning". Moreover, even the traditional Western type of local city planning is only beginning to be undertaken.

The fundamental difference between advanced and developing countries with respect to critical urban problems and their solutions must however be considered. Urban planning in terms of reorganization, redevelopment and relocation, is extremely difficult, expensive and often unavoidably ruthless. But planning to guide entirely *new* growth and development may be easier as well as cheaper, and also permit a far greater degree of economic and individual freedom along the way. Providing magnets and incentives is more important, in this type of planning, than detailed or coercive controls. This is mainly a matter of coordinating certain key public decisions that will have to be made anyway in one form or another, *e.g.*, with respect to transportation, utilities, etc.

Moreover, if the overall urban pattern is more important at this stage than detailed city structure, it may be better to employ the limited supply of professional urban planners at the regional level, leaving local planning administration (except in great metropolitan areas) to people with similar training, as has already been done effectively in village improvement programs.

Most efforts at regional planning have died aborning because there were no administrative or governmental units corresponding to the logical regions for planning: Cities and towns are too small, and the province (or state) and nation are too large. The logical solution to this problem is the creation of new governmental or administrative units corresponding to "natural" regions. But, the experience in developing nations as well as the West is that this is not feasible, politically or governmentally.

Pakistan may be fortunate in this respect. It should be possible to use the existing system of the District and Division, administered by the Deputy Commissioner and Commissioner, instead of creating new units of provincial and regional government. With recent changes, the Deputy Commissioner and Commissioner are now involved more intimately with District and Divisional development and projects, as well as having more responsibilities in the formulation and implementation of the development program. The new institution of Basic Democracies, if utilized for urban as well as rural development, could be integrated into this approach.

There would still need to be over-all policy, planning, and programming guidance and coordination at the provincial level, of the physical development and housing projects with the plans and programs for agriculture, industries, transport and communication, and water and power, for the separate regions. A simple device for achieving coordination of these various plans and programs at the regional level is the concept of the "development map". This would involve a map of each planning region (or Division) on which is placed the yearly development budget items for the Division. An examination of such a map would clearly and quickly show how various sectoral investments are giving rise to various kinds of physical developments and whether these have been conceived in simply financial terms (as has been the practice in the past) and thus are not coordinated physically (or spatially) with each other. This could avoid in the future the error of locating factories in one location, while houses for the workers in those factories are built in another place, and the priority for community services and utilities accorded to a project in a third place. With regional investments conceived in their physical and geographic context in advance and a systematic approach adopted for their coordinated planning and development, within the framework of a regional plan, it should be possible to achieve a

more balanced, harmonious, and efficient development and growth of the various regions.

In discussing the necessary machinery to plan the pattern of urban growth, two distinguished development economists have reached remarkably similar conclusions to those just described.

According to Dr. Bert Hoselitz, "One way of achieving [a better distribution of cities] is the inclusion into national development programs of urban development plans and the simultaneous development of regional capital budgets. . . Unless planned provision is made for the development of new and the expansion of present urban centers, the costs of urbanization are likely to be vast in the long run. By urban planning some of the effects of social disorganization which occur inevitably in the urbanization process can be mitigated. . . Since a large proportion of total capital outlays for development are made in urban areas, regional capital budgeting would provide a guide for the distribution of these capital outlays, chiefly for social overhead, among the different portions of the country. If industry is to be dispersed, one must obtain some reasonably accurate knowledge of the allocation of capital for the construction of social overhead installations in the various urban regions of the country."[4]

Professor Lloyd Rodwin is likewise concerned with the means of "linking economic development and urbanization policy in developing areas. . . A combination of two devices now absent from almost all development programs may prove desirable, if not indispensable. One is the need for a national urban development plan; the other for a regional capital budgeting procedure. The former would provide the sense of direction; the latter would add a strategic control and steering mechanism."[5]

It must be assumed, moreover, that any "national urban development plan" in a large country would probably have to be quite general, and that a "regional capital budget" would need to be related to a more concrete regional plan for physical development, including cities and towns, as explained earlier.

One specific public power would be highly desirable, judging from both Western experience and the present situation in Asian metropolitan areas. This is control over urban land-speculation, whether by advance public land

[4] Berth F. Hoselitx, " Urbanization and Economic Growth in Asia," *Economic Development and Cultural Change* (University of Chicago, October, 1957, p. 54).

[5] Lloyd Rodwin, " National Urban Planning and Regional Capital Budgets for Developing Areas ", *Paper and Proceedings, Regional Science Association* (Vol. 3, 1957), pp. 225.

acquisition or otherwise. High land prices resulting from speculation have always been a major obstacle to urban planning and economical urban housing. And in Asia there is the additional fact that land is still the habitual form of private investment and wealth, while national economic interest requires maximum investment in productive industrial enterprise.

b. *The needed research*

Planning criteria for determining the desirable location and character of future urban development may prove to be the most difficult question. Systematic fact-finding, research and analysis will be necessary, both in general or national terms and under a specific set of regional conditions. A wide range of both economic and non-economic considerations must be carefully gone into in deciding whether new industrial townships should be developed or the existing centres expanded, or a new pattern of rural dispersal encouraged. Broad categories for this research, and some of the questions requiring answers, may be roughly suggested as follows:

(1) *Industrial location criteria*

What types of enterprise must be in the central areas of big cities? What industries can function successfully under what conditions in satellite communities? in independent smaller cities? in rural areas? What non-economic attractions must be provided outside metropolitan centers to attract potential entrepreneurs and skilled workers? What about the social and economic aspects of one-industry towns?

(2) *Technological studies*

At what points can a minimum of advanced science and technical aid best be applied, to provide adequate housing and services with cheap local materials and unskilled or self-help labor? What are the technological trends and possibilities re : decentralized industry?

(3) *Comparative cost-benefit studies in terms of city structure*

What is the effect of city size and density on the cost of minimum standard housing and services for reasonable health, welfare and efficiency? It would be desirable for studies to be undertaken on different aspects of the comparative cost per head of such basic services in cities and in small towns and villages. What about "new towns" versus expanded existing cities or village clusters? Under what circumstances and with what type of aid and guidance can self-help methods be employed successfully? What is the effect of city structure on more subtle and less measurable aspects of family life, educational progress, and social or industrial adjustment?

(4) *The implications and effect of economic policies*

> What proportion of the national budget is likely to be available for urban improvement in the visible future? What types of industry are to be encouraged? Where? What is the effect of current policies with respect to taxation, industrial stimulation, and public investment in resource development, industry and urban improvements, etc. on the pattern of urban growth?

While much of this research should be carried out in libraries, offices, and laboratories, the real knowledge for answering the questions posed may better come from systematic experiments and testing in the field. In discussing the same sort of problem for India, the late Catherine Bauer Wurster referred to this approach as "research-cum-experiment."[6] Pakistan also provides a ready-made laboratory for this work. Industry is being developed here under all kinds of conditions, and more will occur. Many experiments in housing have already been undertaken, and more can be stimulated readily. Every type of urban-industrial pattern already exists, at least in embryo form. The effect of public works programs and credit or tax policies on urban development patterns can be tested in a variety of places.

Mrs. Wurster suggested this approach to research would have an additional benefit:

> By presenting various alternatives for testing in actual use—whether in the form of houses, cities, or opportunities for enerprise and employment—it might stimulate greater public participation in the planning process, and better public as well as expert understanding of the big planning problems. In a way, it means applying upon a far larger scale the basic principle of the Village Development program: learning through doing.[7]

c. *Need for inter-disciplinary training and research*

It should be clear that for research that can be applied to practical policy in this field, intensive interdisciplinary analysis of problems and possibilities in given Asian countries, directly related to potential dicisions, is probably the only effective answer. This has the best chance of success through the institutional form of an Institute or Center tied closely to one or several Universities. Would it be unrealistic to suggest that one of the first steps Pakistan should take in the immediate future is the establishment of such an Institute for Training and Research in Regional Planning?

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[6] Catherine Bauer Wurster, "Overhead Costs and Development," *India's Urban Future*, Roy Turner, editor (University of California Press, 1962), p. 295.

[7] *Ibid.*, p. 296.

D. CONCLUSION

In conclusion, let me say this: The urban challenge facing Pakistan and other Asian countries is, to say the least, an imposing one. To meet and solve it will require the best minds and the finest skills that a nation like Pakistan can muster; it will depend on the assembly of a critical mass of multidisciplinary talents including demographers, economists, engineers, planners, architects, sociologists and administrators—a broad range of physical, life, engineering, and behavioral scientists. It will also require creation of new institutions and changes in established ways of doing things in existing institutions. Finally, it will require new approaches to planning, such as the one I have presented here today.

Urbanization and Urban Development Policy in Pakistan

A. F. A. Hussain

AND

Khalid Shibli

Urbanization is an essential concomitant of the process of economic growth. Economic development in a developing country like Pakistan, with a large disguised unemployment, involves a transfer of population from the agriculture to the industrial sectors. Industrialization invariably gives rise to or accentuates existing agglomerations of population. This is because the growth of the city upto a point leads to increased efficiency in production. Technological economies are realised to a high degree in such areas as transport, credit and marketing. Probably more important is that labour skills are developed and organized for production. On the other hand, it is recognised that unplanned urbanization may lead to much economic waste and social disorganization which may seriously offset these advantages.

The problem of urban development must be approached in a comprehensive fashion. The industrial development must be closely integrated to a programme of urban development which has many facets such as development of transportation, housing, sanitation, education, social welfare, recreation etc. Investment in urban development should be considered as a necessary cost of the broader pattern of economic development. No particular pattern of urban development should be taken for granted on the basis of existing economic development programmes. Detailed studies of the possibilities of location of future economic activities, development of social infra-structure *e.g.*, power, transportation, etc. and market studies will suggest an optimum pattern of urban development. In situations where cities have already grown to great metropolises perhaps nothing can be done except to make marginal adjustments and to initiate action to prevent a further aggravation. For the small and the future new towns a satisfactory pattern of urban development can be evolved. This requires close cooperation of experts in many fields, *viz.*, economists, urban and regional planners, sociologists, transportation experts, building researchers, public health experts etc. Evolving an optimum pattern of urban development for a region is nothing short of a close integration between physical and economic

planning. The economic programme should not suggest a rigid framework for physical planning. Detailed studies on physical planning may well suggest a modification of the existing economic programme which may in the long run be more conducive to the fulfilment of the social and economic goals of the nation.

The aim of this paper is to discuss some of the basic issues of urbanization as found in East Wing.

East Pakistan has one of the highest population densities in the world. The current population is estimated at 56 million within an area of 54,000 square miles. The density exceeds 1,000 per square mile. A conservative estimate places the population growth at the rate of 2.6 per cent per annum.[1]

Agriculture is the mainstay of the population, engaging 75 per cent of the people and accounting for 57 per cent of the gross domestic production.[2] The lack of employment opportunities outside agriculture makes the problem of under-employment serious. It was estimated that the extent of unemployment and under-employment in 1960-61 was as high as 5.9 million man-years or 29 per cent of the labour force.*

The economic problems of East Pakistan received much attention in the First Five Year Plan (1950-55). Allocation to industry amounted to 17 per cent of the East Pakistan programme.[3] Although a sizeable economic and social infra-structure was constructed, the progress of industrialization has been slow. National income increased more slowly than the rate of population growth.

Considerable emphasis was placed in the Secod Plan on the development of East Pakistan. Important institutional and administrative reforms were introduced. The total development programme of the Province in the public sector was raised to Rs. 6390 million. It is estimated that 95 per cent of this expenditure was actually made. In addition there was approximately a private sector investment amounting to Rs. 4000 million. The public sector allocation for industries in East Pakistan under Second Plan was Rs. 880 million. The Plan also provided for a total investment of Rs. 1850 million in the private sector. It has been estimated that 85 per cent of the planned investments in the industrial sector were actually made. It has also been estimated that the gross domestic product of the Province increased by 33 per cent in real terms in the Plan period. Significant structural changes occurred *pari passu* with the growth of the Provincial income. The share of agriculture decreased from 62 per cent in 1959-60 to 57 per cent in 1964-65,

[1] The area excludes the large rivers. The population figures refers to 1964-65 and is based on the Population Growth Estimate of the Central Statistical Office and the Institute of Development Economics, Karachi.

[2] Government of East Pakistan, *Economic Survey of East Pakistan* 1964-65, 1965, p. 2.

[3] Ibid, p. 9.

while the share of manufacture increased from 6.2 per cent in 1959 to about 8 per cent in 1964-65. The absolute contribution of agriculture to G.N.P. (Gross National Production) increased by 22 per cent while that of manufacturing by 69 per cent. The contribution of infra-structure and services to G.N.P. increased by a little over 53 and 44 per cent respectively in the same period.[4]

The Third Plan envisages a vastly accelerated development programme for East Pakistan with a view to raising the G.N.P. by 40 per cent in the Plan period. Out of a total investment of Rs. 52,000 million programmed for the entire country, investment in East Pakistan would amount to Rs. 27,000 million; of which Rs. 16,000 million would be in the public sector and Rs. 11,000 million in the private sector. Industrial investment is planned to be about Rs. 650 crore; of which Rs. 270 crore would be in the public and the rest in the private sector.

The magnitude of the development effort, and in particular the acceleration in the industrial investment programme, poses serious problems of urban development and utilization of scarce land. From the First Plan period the urban population (concentration of 5,000 persons and above), in spite of the modest programme of industrialization, increased from 1.7 million in 1950 to 3.6 million in 1965. The industrial investment programme and the improvement in communications which are envisaged in the Third Plan may be expected to further accelerate this urbanization, and it is expected that urban population of East Pakistan may reach the 4.7 million mark by 1970 (6.7% of the total population).

The rapid pace of development in the context of the high density of population has highlighted the problem of inadequacy of urban land not only for industrial but also for commercial, residential, public utility and other uses in every part of the province where rapid economic growth is taking place. The situation is aggravated in that there is a tendency for economic activity to be concentrated in a few large cities. This is a self-reinforcing trend and may be expected to continue indefinitely unless deliberate and effective measures are taken to channel industrial investment into new locations and thereby promote new centres of economic activity.

Dr. John Edison, a pioneer in the study of the urban development in East Pakistan, has estimated on the basis of the Third Plan industrial programme that industrial demand for land alone would be at least 12,500 acres or 2,500 acres per year. To this must be added another 13,000 acres per annum

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[4] *Economic Survey of East Pakistan* 1964-65, 1965, pp. 3-4.

or 65,000 acres in the Plan period of improved city land for commercial, residential and public uses. The total urban land requirement in the Third Plan is a conservative estimate of 77,000 acres. This would give an urban population density of 100 persons per acre or 64,000 per square mile. Writing in 1963, Dr. Edison observed:

> When a nation or province embarks on a programme of industrialization, it simultaneously commits itself to the process of urban growth. This growth may be haphazard or orderly, concentrated in a few giant metropolises or distributed over a considerable number of towns and cities. It may become a source of constant unrest and dissatisfaction or it may be a means of developing a new and prosperous economic structure. The decistion of the Government to undertake a major industrialization effort in East Pakistan has committed the province to a transformation from a rural to a semi-urban economy. The implications of this transformation do not yet appear to have been adequately understood.

The problem of urban development is not merely quantitative in nature as developing a fixed amount of land per year and making it available for industrial and other urban uses. The location of this land which must be based on the location of industries is also crucially important. Optimum industrial sites depend on a number of factors, *e.g.*, its suitability for particular purposes, adequacy of transport, power and other facilities serving this land, access to raw materials, markets and industrial services and above all availability of skilled manpower. From the economic standpoint for the great majority of industries it is advantageous to be located near a large industrial town or city. This gives rise to serious over-crowding with attended problems of housing, sanitation, transportation, education, labour and political problems. Price of urban land has sky-rocketed, making public investment extremely costly. Any possible economies to the private industrialist is more than offset by the diseconomies generated in the public sector. The reluctance of private investors to venture out of larger cities can be partially offset by generous tax concessions and other inducements. But a satisfactory long-term solution seems to be to provide attractive alternative locations for industries which would make it possible for them to operate at low cost competitively with units located in the large industrial centres. In other words, the Government may with advantage adopt programmes and policies aimed at fostering secondary industrial centres in appropriate locations in various parts of the province. After the locations are selected various social and economic infra-structure needs to be systematically developed in these areas.

The trend of industrial location in the province has been in the direction of concentration in three centres, Dacca-Narayanganj, Chittagong, and

Khulna. In the two former areas diseconomies in the social sense of further concentration have already set in. Apart from these there are a number of locations where there are good possibilities of developing secondary industrial centres. These are probably Comilla, Brahmanbaria, Bhairab Bazar, Ghorasal, Narsingdi, Barisal, Mymensingh, Sylhet, Rajshahi and Bogra.

There is need for studies which would suggest an optimum pattern of urban development in the province. Next step would be to develop long-term plans. Required is a comprehensive *inter-disciplinary approach to work out a physical plan for the province.* It also involves at the policy level a close co-operation between different government agencies responsible for the formulation and execution of development programmes in various sectors which impinge on urban development.

These considerations have led the Government of East Pakistan to set up an Urban Development Directorate. An Urban Development Council which would help co-ordination of the policies of the various government departments bearing on urban development is also to be set up in the near future. The work to be done by the Urban Development Directorate is as follows:

I. Collection of data, research studies and analysis.

II. Preparation of an Outline Physical Development Plan for the Province of East Pakistan and identification of areas or sites or centres for urban growth. Presentation of the Plan to the Government, its approval and adoption.

III. Selection of 2 or 3 areas or sites or centres. Development of the approved Plan and preparation of Plans for the development of the same as new towns. Presentation of these Plans to the Government for adoption.

IV. If approved and desired by the Government, further detailed planning and designing of these new towns may be taken up for actual implementation. (This will involve land acquisition, planning, engineering works and all other development etc. related to the implementation phase).

Along with the work mentioned above, efforts will be made to present to the Government clear-cut proposals for organization of an effective and appropriate Urban Development Institution as well as appropriate legislation for guiding and controlling the physical development of the Province.

In sum, urbanization and urban development have an intimate relationship with economic development. Unfortunately, urbanization has not been considered as a positive tool for development. And unplanned urbanization has produced many disruptive effects that the very objective for which

the economic development is being used as a tool is either undermined or negated by a fragmental approach to the overall development policy. These experiences naturally created the need for a revision of the overall development policy and an urgent necessity for crystallizing a systematic and new policy for urban development.

II. Urban Development Policy

Urbanization and Urban Development in Pakistan. Although the areas now constituting Pakistan have a brief political history, these have been cradles of old and dynamic civilizations. Pakistan has a rich history and tradition of town building and housing. Witness the precise city planning in the Indus Valley as well as the zenith of development and status enjoyed by the cities of Dacca and Lahore during the Moghul period. Stable and prosperous rural life also flourished side by side with this advanced urban culture. From the time of Alexander the Great to the 7th Century, foreign visitors wrote colourful reports about the Indo-Pakistan sub-continent.

In the 7th Century, when the Chinese traveller Hiuen Tsang visited the East Wing, he remarked on the regular and intensive cultivation of land and the production of grains, fruits and flowers in abundance. Agriculture was the backbone of the economy. Under the peaceful, and generally efficient rule of the Mughal viceroys, the area achieved much prosperity which was based upon a diversified economy. In the early Nineteenth Century the area was converted largely into a raw material base. There were, however, two major industrial type operations: cotton and silk manufacturing and indigo processing. After the advent of the English rule, there was a decline and practical disappearance of the world famous cotton manufactures and several other smaller industries. This set into motion a process of de-industrialization and consequent change in economy to a completely agrarian pattern. Poverty became wide spread and thousands of skilled workers swelled the ranks of the unemployed and the pressure on land increased. Modern industry made hardly any progress and industrial investment became dependent on a momentum deriving from the ideas of foreign investors. Serious problems of transport and communications, lack of organized industry, unsteady commercial advantages and some decay of certain urban areas retarded any rapid urbanization.

Let us now turn to Lahore in the West Wing. Lahore or Lahowar means the seat, a fort, or the enclosure of Lah. When Hiuen Tsang passed through the area in the year 630 A.D., Sialkot was of greater importance than Lahore. Towards the end of Ghaznavi period, Lahore began to increase in power. After Babar's death in 1530, his son Kamran seized the Punjab and annexed Lahore to Kabul. Akbar had great affection for Lahore and the Mughals made Lahore the royal residence and accentuated the glory of the

city with gardens, palaces, and mosques. Lahore grew famous for its architectural beauty. The most important work undertaken by Akbar was the construction of the city wall and the extension of the Fort. Lahore was one of the important centres benefiting by the increase in trade and business that the strong arm of Mughals brought to this part of Asia. Lahore probably reached the zenith of its development by the end of 16th Century. In the first quarter of the 17th Century there were already signs of collapse. It is no great mystery how Lahore declined. The English came and the trade routes dried up. The city was left stranded, like the towns and deserts when the river changes its course. This is a rather oversimplified explanation. Other events must be considered including the decline and fall of the Mughal Empire. Reports of foreign travellers in the first half of the 19th Century, give a clear impression of the city prior to the British occupation. As in the case of Dacca at the same period, all these reports mention decayed cities with extensive ruins. In their own fashion the British ignored the old city, and built up a cantonment and created their institution of the "Civil Lines".

All this goes to prove that cities do not exist in isolation and they are not the creation of architects and city planners alone but the fundamental ideas and concepts are evolved or created by the total civilization itself, and as the civilization declines and withers away, this is also reflected in its cities. Pakistani cities are a curious record of the rise and fall of the Hindu, Muslim, and British "civilizations". At the time of independence in 1947, Pakistanis faced a very formidable problem. There was a very well-defined renaissance of the national sentiment, a large number of displaced families and persons crowded into urban and rural areas, and the whole nation had to face the problem of creating a new governmental framework as well as pattern of life.

Although the nation was new, the towns were old. The past could not be erased overnight. This posed serious problems of re-adjustments as well as planning. The nation could not afford to abandon the old towns altogether and like Taxila and Mohanjodaru to found immediately brand new cities in consonance with the new spirit of Muslim renaissance. The enormous mass of refugees seeking shelter in already over-crowded cities aggravated the problem. From 1947-55 during the First Plan (1955-60) and the Second Plan (1960-65) periods, the Government and the people were fully occupied with the settlement of displaced and shelterless families, planning for economic development and industrialization, as well as rationalizing and improving the national, provincial, regional and local government networks.

The history of urbanization in Pakistan can be easily divided into three phases, *viz.*, ancient, medieval (the Mughals, and the British) and the post-independence. In the ancient phase there was a harmonious balance between the urban and the rural, and during the Mughal part of the second phase,

there were glorious cities and balanced development, while the British part of the second phase was marked by the evolution of the "Cantonment and the Civil Lines" and a general decay of the old city. The last period of post-independence phase is marked by a rapid urban growth and evolution of large slums, side by side with poorly planned but expensively built fashionable colonies for the upper-middle and the rich classes, acute scarcity of community facilities and utilities and an out-dated and over-loaded urban transport system. The third phase is also marked by a new development, *i.e.*, a widening socio-economic and technological gap between the urban and the rural areas of Pakistan.

The Government and the planners were naturally somewhat puzzled by this phenomenon, as during this period the country did make substantial economic progress and the rate of economic growth, especially during the Second Plan period, was considered to be not only substantial but praiseworthy. However, somehow the growth of services and facilities did not keep pace with this remarkable economic growth and as such the physical environment has progressively deteriorated. Witness the chaotic physical conditions, soaring urban land prices, housing and transport problem, over-loaded utilities, community services and facilities, in all our growing urban areas; and the heavy economic and social costs that have to be borne by a rural family while migrating to the urban areas. Perhaps it is necessary to highlight here an intriguing feature of urbanization. Urbanization disintegrates the natural cohesiveness of the rural living conditions, brings the effected individuals together in a new environment and then seeks ardently to create a socio-economic viable community out of them—more or less artificially, in the hope that the forces which have compelled these individuals to a state of social disorganization would enable them to get knitted together in an effective and socially productive pattern. Since independence the Government has embarked on a programme of economic development which has been causing substantial population shifts. Some idea of the magnitude of this problem can be grasped from the following table:—

URBAN POPULATION
(1901-1970)

(Million Persons)

Year	East Pakistan	West Pakistan
1901	702,000	1,619,000
1950	1,780,000	6,000,000
1960	2,780,000	9,830,000
1965	3,000,000	12,880,000
1970	4,700,000	17,100,000

The crux of the problem is that economic development has concrete manifestations in space as it involves changes in activities and their spatial relationship. The principal cause of deterioration of physical environment is the lack of co-ordination and integration of economic planning with physical and social planning. Establishment of an economic activity, say a factory entails parallel investment in public utilities, roads, transport facilities, houses, sanitation, schools, hospitals etc. As in many cases all these investments are not seen as an aggregate or co-ordinated by a physical plan the total requirements are under-estimated and hence the physical environment starts to deteriorate.

During the two Plan periods, as the Government and the people were fully occupied in solving the problem of displaced persons, it was not possible to give immediately some attention to such a comprehensive approach to urban development. As such it can be safely concluded that our nation did not have any clear-cut urban development policy till the beginning of the Third Plan period.

b) New Approach to Urban Development Policy

At the conclusion of the first two Plans, the Planning Commission and the Government realized that it was not possible to solve the problem of urban development by an isolated "Public Works Approach". It was felt that economic planning had to be made more comprehensive in order to deal with the problem of social welfare. The Government had realized that although the *per capita* and national income were increasing, it was not certain whether the *per capita* and national welfare were also increasing. In case of a developing nation like Pakistan, it is possible to evolve minimum standards of *per capita* welfare in terms of food intake, shelter, water and sanitation, health, clothing etc. It was also realized that with the accelerated tempo of economic development as well abnormal population growth, the rate of urbanization was going to be accelerated; therefore it was essential to have a national programme for urban development as well as clear cut policies for shaping the future urban growth. The Planning Commission realized that it was necessary to broaden the base of economic planning and integrate national and regional physical planning as a component of the national development plan.

For sometime in the near past, the field of national planning was littered with many controversies; polemical, ideological and other. Recently most of these differences seem to have been resolved. We no longer ask: is planning possible? or can it be resolved with democratic ideals or does planning lead to socialism or bureaucracy? The current question instead is: how to plan? And how much to plan? Not only is the great ideological debate

almost over, but also for most of the developing economies the idea of national economic planning has become so popular that its absence is taken as an index of backwardness.

In spite of this development several of developing countries are not very familiar with the techniques of integrating social and physical planning within their national economic planning efforts. Social planning is taken for social work and other remedial social; while physical planning is taken for simple city planning or planning of metropolitan areas. These are extremely limited views of two vital components of national development planning. The concept of physical planning may be illustrated by giving an example from development planning.

Economic plans generally concentrate on capital use. They do not include plans for the use of land, key construction materials and a desirable spatial organization of various activities. As such the national economic plans leave these decisions to various implementing agencies of the central or provincial governments as well as their regional and local counterparts and private investors with the hope that all these organizations will automatically bring some kind of an overall coordination and balance by a budgetary allocation designed to bring the development programme within the limits of available resources (available resources in this context always being considered as totality of the financial resources domestic and/or foreign). This is a convenient assumption of economic planning. Coordination is more than budgetary. The art and science of national planning have now developed to a point that it is felt that various development programmes and their sectoral allocations cannot be entirely in terms of financial allocations as well as their identifiable links to pure economic growth. It has been found that because of certain deficiencies in the field of national economic planning (although in certain cases substantial progress was achieved in pure economic development and growth), the welfare and well-being of the people could not keep pace with the economic growth and as a consequence serious social and physical problems ensued which in turn negated the very objective for which economic development was being used as a tool. These failures have shown the need for integration of social and physical planning within the national economic development plans.

Physical planning deals with the planning of physical environment which is composed of land, physical structures and various construction activities related to the creation of these structures. It is the geographic expression of a nation's economic and social policy; and is related to distribution and redistribution of the productive forces of a nation for better use of national resources.

For most of the developed economies, these problems have been very well rcognized and certain techniques of national, regional and local physical planning have evolved. Although in centrally planned economies physical planning has been an intrinsic part of their national development plans, some remarkable achievements have also been made in this field in the United States of America. Around 1930, during the depression years, the United States Government created the National Resources Planning Board. President Roosevelt, who firmly believed in the physical development of the country on a planned basis, created this national institution to make a comprehensive analysis of all resources of the country and to frame plans for their use and development. Although the Tennessee Valley Authority (T.V.A.) is one of the popular achievements of this effort, the National Planning Board conducted a very large number of exhaustive studies and promoted a number of planning policies which still form the bench marks of physical planning in the United States.

Similarly many European countries took specific measures for safeguarding and developing their physical environment. Netherlands, Germany and France, for some examples, have very old and well developed traditions of national physical planning. The Dutch have had scientific physical planning legislation for sometime and this was brought up to date by their new Physical Planning Act of August 1965. This Act regulates the planning activities of the Government at national, regional and local levels. The Federal Republic of West Germany has a long history of national and regional physical planning. In early 1965 there was enacted a new comprehensive law for regional physical planning and development. The French have now created a National Physical Planning Organization, after approximately 20 years of varied experience of physical planning. This National Physical Planning Organization is part of the Directorate General of Economic Planning. The techniques and traditions of national and regional physical planning are very well developed in centrally planned economies like that of the U.S.S.R. in this system physical planning is an integral part of economic planning. The Soviet Union has used this technique not only for planned physical growth of the entire nation, but also for promoting and developing an approach for new towns. In the U.S.S.R., 1,000 new towns have been built between 1926-64. These are self-contained units.

These new towns have been built with the special objective of a balanced development of the whole country. Most of these are located in the Eastern Regions of the Soviet Union (in the Republics of Kazakh, Turkeman, Uzbek etc.) The Soviet national and regional planning is especially concerned with a rational distribution of the forces of production and a systematic integration of the population distribution policy. This policy

has promoted the location, planning, and development of new towns in the U.S.S.R.

National Physical Planning also has a long history in most of the other centrally planned economies. Because of simplified political and administrative system of the centrally planned economies, the integration and implementation of physical planning does not face as many challenges as it does in other parts of the world where a large number of other factors and interests have to be analyzed and reconciled towards comprehensive national goals and objectives. In this context, the development of National Physical Planning in the Netherlands is of special interest. The Dutch physical planners try to ensure that appropriate and desirable coordination exists between the distribution of employment opportunities and the distribution of population. Some years ago a National Ministry for Physical Planning was created. One of its principal tasks is the harmonious development of all the different regions of the country in order to create optimal working and living conditions.

The above brief description shows what is meant by national and regional physical planning and why it is different from simple city planning. Village, city and metropolitan planning actually merge into physical planning, which is a different and a wider concept and encompasses many other fields besides city planning (such as Geography, Geology, Engineering, Engineering Economics, Sociology etc.) Experts and specialists of these various disciplines make individual and joint contributions to the overall field. The principal argument here has been that efficiency and harmony of the quality and quantity of productive forces, but in addition depends on the nature of arrangement of these productive forces in terms of land, physical structures and construction activities. Certain amount of knowledge and techniques for national and regional physical planning are available from the experience of advanced economies, (whether centrally or partially planned). The contributions made by the U.S.S.R., the United States of America, and the Netherlands are valuable and worth detailed study.

In Pakistan, the concept of national physical planning was introduced for the first time in the Third Five Year Plan. This new development was made possible by the interest of the Chairman, National Planning Commission, (President Mohammad Ayub Khan, N.Pk., H.J.) who is intensively interested in translating the ideal of a welfare state into a pragmatic approach towards national planning and development. In November, 1963, the Chairman of the National Planning Commission examined a note wherein it was pointed out that economic planning alone will not be able to solve the complex development problems of Pakistan (copies of this note are printed in Planning Commission's Study No. P.P. and

H. 12). A plea was made that a new concept of national planning was essential. After some detailed research, analysis, and discussions, it was decided not only to create a Physical Planning and Housing Sector within the Planning Commission, but also to prepare the Third Five Year Plan within this new conceptual framework.

To systematically develop this new concept, the staff of the Physical Planning and Housing Section of the Commission immediately launched a programme. The research results have been printed in limited number, copies of which are available in the Planning Commission's Library.

The Physical Planning approach adopted by the Commission was based on the coordination and integration of sectoral programmes in terms of the most advantageous uses of the land at a given level of development and the infrastructure required to service the land uses. Included also was an optimum utilization of building materials and construction activities. This approach ensures that sectoral projects are built when and where needed.

The crux of the problem is the coordination and integration of sectoral programmes having a physical component. An important corollary is that the present budgetary type of planning should be further improved and made more important by analysis of the real and physical resources as well as the analysis and programme of physical coordination.

Although the approach adopted for the Third Plan is quite radical, some writers on development planning have even suggested that budgetary planning and budgetary functions should not really be the concern of national planners, who should actually address themselves fairly and squarely to the task of working out an overall development plan based on the total available natural resources of the country in terms of the most urgent needs and check against the geographical analysis and problems.

It becomes clear that there is neither conceptual awareness of comprehensive rational planning nor any systematic administrative machinery for its implementation. The new concept adopted in the Third Plan adds another dimension to the National Planning process by focussing attention on regional and local needs and development as well as crystallising a comprehensive planning system well integrated on local, regional and national levels. For the approach to be effective, a systematic and viable programme of regional planning and development will have to be initiated. Except for overall policy control and co-ordination, however, it will be necessary to stimulate local administrations and authorities for regional and local development and to delegate to them the necessary powers to

implement the programme. The new institution of Basic Democracies will need to be fully integrated within this approach.

Basic Democracies have been successfully utilized for rural development. So far they have not been fully utilized for urban development. Such a programme for the urban areas will pose very many challenges which have not so far been met in the rural works programme. In the rural areas there still exists a spirit of community cooperation. The situation in the urban areas is somewhat different. During the process of urbanization, the rural immigrants, who then become industrial, commercial or white-collar workers, go through such a frustrating phase of adjustment to the new unsympathetic and hostile urban environment. Many of the traits of cooperation, community action and an optimistic belief in the final results or such an action are slowly submerged in their sheer struggle for survival. Against this background, the manner in which a programme of urban works can be initiated and the latent energies of these people can be mobilised in the same manner as in case of rural works programme will be the key challenge to the Government.

Local Government is in a developmental state. It may not be possible to institute immediately radical measures. Nevertheless real hope lies in the new institution of Basic Democracies and it is contemplated that with further research, appropriate thinking, and some fundamental structural changes, it may be possible to initiate an urban works programme within the framework of Basic Democracies.

Such types of efforts are being carried out successfully in various parts of the world. In the United States such programmes were taken up all over the country during the depression period, and similar programmes are now being launched on a limited functions basis for under-privileged or problem groups in urban areas. In centrally planned economies like those of China and the U.S.S.R. programmes of this type form part of their planned efforts for national reconstruction. In both cases the energies of the urban population were mobilized either due to an acute crisis or by intensive system of community education, value reconstruction, and decentralization as well as delegation of certain powers to local Governments. The important feature in these experiments (whether U.S.A. or in the U.S.S.R.) is the sense of participation that the urban population have in these ventures. A partnership between the people and the government cannot be created by an executive order or by expanding the bureaucratic net work or by relying on an optimistic belief that eventually people will work out some solution for themselves. This will require intensive research and thinking and a deliberate programme will have to be chalked out and tested on basis of pilot projects.

The Rural Works Programme has been oriented towards certain types of rural development. The approach suggested here points out the need for an urban development programme within this overall philosophy of the Works Programme. This means an integration of urban and rural development within a framework of regional development planning. Although a little later some further explanation will be given how an overall programme of regional development planning is to be initiated, it is necessary to point out that the Works Programme, in context of urban and rural development can make a dynamic contribution to the whole field of regional planning. The public expenditure, though relatively small, will act as a catalyst for bringing forth public enthusiasm on cooperative self-help-basis.

Policies, plans and programmes of water and power, transport and communication and industries sectors broadly lay down the general framework for the overall physical development of a region. The general pattern and distribution of urban and rural communities is actually determined by these extraneous influences. It is not possible to have meaningful development of urban and rural communities without effectively relating the distribution of population and facilities for living in urban and rural areas with the growth of economic activities and employment opportunities. The Physical Planning and Housing Project, therefore, need to be coordinated with plans and programmes of agriculture, industries, transport and communication, and water and power. The most rational and functional administrative unit for achieving such an inter-sectoral physical coordination and optimum efficiency is "the region". To illustrate the approach in a simple and crude manner, if we consider a Division of the Provincial Government as a unit for regional planning, we can immediately see the confusion that is prevailing due to existing traditional approaches to development planning. If we make a simple effort to put the yearly development budget of the Government for a particular Division on a geographic map, it will immediately become clear how sectoral investments are causing various kinds of physical developments which have been simply viewed in financial terms and are not producing optimum efficiency. In such a scheme of things, factories may be located in one place, while houses might be built in another place and the priority for community services and utilities may be accorded to a project in a third place. Had these regional investments been viewed in their physical and geographical context then it would have been possible not only to achieve a balanced and harmonious development and growth, but also optimum efficiency and economy. The first important need is to create viable planning regions in both of the provinces and then initiate regional analysis and planning follows this approach the major investments for the physical infrastructure will come from the regular development budget of the Government.

By this type of regional planning we cannot only predict and control physical development but also influence the achievement of predetermined objectives.

In regards to this suggestion it may be useful to consider the possibility of utilizing the existing institutions of the Deputy Commissioner and the Commissioner instead of creating new planning and development units of provincial and regional governments.

The present legislation on physical planning is not conducive to regional planning and development. Most of it consists of scattered Acts and Orders. For example, in West Pakistan there are at least 23 various Acts and Orders which relate to physical planning. It is necessary that appropriate legislation for physical planning on regional and local levels should be enacted at an early date.

d) INITIAL EFFORTS IN THE THIRD FIVE YEAR PLAN (1965-70)

To initiate a scientific programme of national development, the Third Five Year Plan was formulated within the framework of a "Perspective Plan". The twenty-year perspective plan period is arbitrarily selected and there is no profound reason for its determination. It seems to be on one hand long enough to permit a meaningful structural change in the economy and on the other not so long as to be without direct interest to the present working generation. The primary objective of the Perspective Plan is to eliminate poverty. To realize this objective, long term planning must proceed not only in financial terms but also on a physical plan so that adequate supplies of food, clothing, decent housing, and desirable living environment are available over the next 20 years to all citizens. The Perspective Plan envisages an average growth rate of 7.2 percent in the Gross National Product over the next two decades. The growth rate is expected to increase from the current level of about 5.7 per cent to 6.5 per cent in the Third Plan and 7.5 per cent by the Sixth Plan. Implicit in this growth pattern are significant structural changes in output, employment and external trade. The population is expected to grow at an annual compound rate of about 2.6 per cent during the Perspective Plan period. The following tables show the planned structural changes in the G.N.P.

PLANNED STRUCTURAL CHANGES IN THE GROSS NATIONAL PRODUCT

(Percentage Share of the G.N.P.)

	1965	1970	1985
Agriculture	49	45	36
Manufacturing	12	14	21
Other sectors	39	41	43
	100	100	100

CHANGES IN EMPLOYMENT PATTERN

(Percentage Share of Total)

	1965	1970	1985
Agriculture	65	62	49
Manufacturing	11	12	14
Other sectors	24	26	37
	100	100	100

These structural changes in the economy will bring about a dramatic change in the urban development pattern of Pakistan. The following table shows the overall picture of the total urban population and estimated projections for the Perspective Plan period.

NATIONAL ESTIMATES OF URBAN POPULATION

Year	Total Population	Total Urban Population	Urban Population as Percentage of the Total
1901	45.5 million	2.3 million	5.6 percent
1960	99.00 „	13.0 „	13.0 „
1965	112.00 „	16.0 „	15.0 „
1970	127.00 „	22.0 „	17.0 „
1985	190.00 „	60.0 „	31.0 „

From the above tables it is evident that Pakistan is going to face serious growth problems in utilities for the urban as well as the rural populations.

The initiation of a Perspective Planning approach is a great step forward for effective physical planning on national, regional and local levels. Actually, a five year period is too short. The physical planning and housing sector of the Third Five Year Plan has been framed within the overall 20 years Perspective Plan. The overall plan was formulated partly against the background of certain concepts of Perspective Plan. The overall plan was formulated partly against the background of certain concepts of Perspective Planning and partly on the basis of an input-output econometric model.

In reference with the integration of physical planning with national economic planning and the introduction of long range Perspective Planning

two key fundamental approaches were adopted in the Third Five Year Plan. The task ahead is not only to provide living space to those who are without shelter and to new urban householders but to create a decent and healthy environment for family life in well-knit and economically viable communities.

The most important feature of the sectoral strategy of the Plan remains the physical planning approach which involves the planning of the total environment. A fundamental task is to formulate systematic policies of population distribution in harmony with the distribution of productive forces and development ot natural resources. A strategy of total environmental planning will need to be developed: for land use, transport, utilities, houses, community buildings, facilities and services as well as environmental sanitation including air and water population. In order to achieve positive results, the national scale of planning will need to be further translated into a regional scale encompassing an effective participation and contribution of all local bodies within a planning region. Within this framework of regional plans, detailed physical development plans will need to be prepared for various urban and rural communities.

The development programme for the physical planning and housing sector in the Third Plan is framed in line with the long run strategy outlined above. In the construction programme highest priority is accorded to low income public housing and housing for industrial workers. Next in order of importance are the provision of essential facilities such as safe drinking water, sewerage, drainage, garbage disposal and rural sanitation. In the rest of the programme, special emphasis is placed on the development and promotion of local planning and local government.

The top priority programme of Basic Development consists of four integral parts, *viz.*, improvement of existing agencies; creation of necessary new institutions; preparation of physical plans on local, regional and provincial levels; planning and development of new towns and villages, and special projects for research, surveys, mapping and collection of data. It is proposed to create independent departments of physical planning and housing at Lahore and Dacca. The new departments would be created partly by re-grouping the existing scattered facilities and partly by adding essential staff and services. The U.N. Special Fund has agreed to assist this area, by launching a unique project in East Pakistan for preparing physical plan for the whole province with major emphasis on urban development. The Special Fund Project was initiated in September 1965 and will be finalized by the end of the Third Plan period. Besides preparing a provincial physical plan, the project will seek to identify additional major urban centres so that the provincial government may adopt a comprehensive

approach for advance planning and development of these centres. In West Pakistan, a pilot programme for comprehensive regional planning will be initiated and new towns and villages will be developed within a regional scheme. A special physical planning cell will also be developed at Lahore for providing leadership and guidance in addition to collecting data and carrying out special research and evaluation work.

EVOLUTION OF THE URBAN DEVELOPMENT POLICY IN EAST PAKISTAN

The urban development policy adopted in the Third Five Year Plan found a positive and dynamic response in East Pakistan, where a unique pilot project is now underway.

Beginning with the First Five Year Plan (1955-60), the people and government of East Pakistan have been going through a dedicated and dramatic effort for sustained development. The Second Five Year Plan (1960-65) almost tripled the industrial investment over the levels in the First Plan. This commitment of the government to the industrial development of the province simultaneously commits it to a process of urban growth. This growth may be haphazard or orderly, concentrated in a few giant metropolises or distributed over a considerable number of towns and cities. The programme of the government to undertake major industrialization in East Pakistan has initiated a transformation of the economy from a rural to a semi-urban type.

The Third Five Year Plan will see the emergence of a new level of industrial and urban development in East Pakistan. In addition to these major centres in which industrial growth and urban expansion is now taking place, the government intends, on the basis of present knowledge, to identify three or four towns and commence planning for the development of these areas with the resources available.

The urban problem facing East Pakistan may not be unique but it certainly is difficult. The characteristics of dense and fairly uniformly distributed rural population, the absence of large cities, the distinctive topography and hydrology, the scarcity of building land, and the relatively new man-made service assets present both a challenge and an opportunity. Because the urban centres are small and poor and the transport system under developed, these make it possible to locate industries in positions where maximum efficiency and economy may be secured as to sources of raw materials, markets, transportation etc.

The first step is to undertake studies which will provide the Government with a basis for making policy decisions about the sites to be reserved,

acquired, and developed for industrial and urban purposes. A decision in principle can now be taken that over-concentration in a few massive unmanageable cities must be avoided.

The character and extent of industries likely to exist in the country by 1985 need to be established. Then studies must be undertaken of the most effective scale and distribution of the future industrial groupings. For some future major industries, precise locations may be identifiable, *e.g.*, iron and steel, petro-chemicals, etc., but for others which may be smaller in scale and more numerous, it is the principle of distribution and industrial linkage throughout the province that is important in order that land requirements can be estimated and sites can be planned and prepared to receive a series of manufacturing complexes of predetermined scale and type.

The Third Five Year Plan (1965-70) as well as the Perspective Plan (1965-85) for the province include provisions for large scale expansion of industry. This, in turn, together with the growth of trade, commerce and administration will give rise to the rapid urbanization. It is not possible to be precise about the changes that will take place, but the forecasts indicate that by 1985 total population may have reached 110 million and urban populations may have increased from 2.7 million to 25 million.

It is unlikely that the Government will permit the expansion to be confined only to the three existing industrial areas: Dacca/Narayanganj, Chittagong and Khulna. It seems preferable to plan for the orderly and systematic development of a larger number of new industrial and commercial centres which will be appropriately located throughout the province to bring the advantages of employment and town facilities closer to the people in the rural areas. With this objective in view, it is proposed that an Outline Plan should be prepared for industrial location and urban growth for the whole Province and that administrative steps be taken to develop progressively selected areas in which land can be made available for industries, housing, commercial purposes, etc. The first step in this direction was taken by the Provincial Government in setting up a Committee to consider perspective sites. Experience has shown that the task is too exacting to be tackled in this way. It is a full time undertaking. Special technical skills are required and vigorous and imaginative administrative measures will be needed to organize planning and land development.

Over the past few months a great deal of thought has been given to the best way of handling this matter. Firstly, there is the problem of deciding on the economical pattern of industrial location and urban development that should be followed. Then there is the work of land acquisition, planning and site preparation that is required. In this connection consider-

ation must be given to the possibility of land reclamation by dredging and other methods to avoid the loss of agricultural land. At present town development is the responsibility of municipal councils. These bodies cannot be expected to cope with the manifold increase that must occur in many areas. There are insufficient technical or administrative resources to enable a large number of new development authorities to be set up (like Dacca Improvement Trust, Capital Development Authority, and Karachi Development Authority) and it would not seem practicable to tackle the work through departmental channels. These considerations originally led to the view that one new Urban Development Authority might be set up to undertake the work for the entire province. To provide the Authority with expert technical assistance needed to prepare the Outline Plan and to undertake the other technical work involved a request was made to the United Nations Special Fund. The Fund has accepted the project.

Briefly, the original proposal was to create a new Authority charged with the responsibility for advising Government on the measures which should be taken to develop and expand cities for industrial and other purposes. A draft Ordinance providing for the creation of the new Authority has been prepared with the following main characteristics :

Constitution : The Authority would consist of a chairman in whom full responsibility would be vested. The Chairman would be assisted by a Member also appointed by the Government, and a Financial Advisor.

Establishment : The Authority would have powers to appoint its own staff and to determine classification but the Government would retain the right to make rules governing such matters.

Finance : The Authority would establish a fund into which government grants and loans and other revenues would be paid and from which administrative and developmental costs would be met. The Authority's budget would be subject to approval and its accounts audited in the usual way. It is expected that the Authority would normally operate at a profit.

Land : The normal land acquisition powers would be provided but special administrative measures would be necessary to ensure that the Authority can acquire at raw land value and not at inflated prices.

Scope of Work: The investigation and planning functions would extend over the whole province, master plans and site development would apply to selected areas (initially three and later twelve or fifteen as required) and technical assistance would be available to improvement trusts, Municipal Committee and other bodies.

Policies : An Urban Development Council, would be created with the A.C.S. as chairman and consisting of high ranking officers from departments of local government, Works, Industries, Transport, etc. to ensure that the Authority is fully advised about the developmental needs of the Province. Provision is made for the Authority to co-operate closely with Municipal Committees. .The Provincial Outline Plan, master plans and development programmes are subject to approval.

It was recommended that an Urban Development Authority should be established for the servicing of this new project. This proposal is summarized in Study No. P.P. & H. 17, "Urban Development Authority in East Pakistan". The proposal was examined in detail by the Provincial Government and then discussed by the Provincial Council of Ministers, on February 16, 1965. The Council of Ministers made the following points :

1. The urban population in the province is likely to grow from the present level of 2.7 million to 25 million by 1985.

2. The rapid growth of industries and towns and cities require the adoption of a scientific study for planning new urban centres.

3. Advance planning of township-industrial or otherwise has not been undertaken anywhere in this part of the world. Hence the U.N. was most anxious to help Pakistan in adopting a pilot project in East Pakistan.

4. The complete survey for this purpose will take a minimum of 2-3 years.

5. At present numerous departments and agencies are concerned with various aspects of urbanization and at times their responsibilities overlapped. There was a felt need for a co-ordinating agency to be located in any existing department of the Government or to be created as a new department, *viz.*, a department of urban development.

6. There is an existing Town and Country Planning Scheme. The proposed Urban Planning Council, when it materialises, should not

ignore the requirements of the countryside and must ensure a harmonised development of town and country.

After discussion of the matter the following decisions were taken :

i) The Council agreed in principle that there should be an organization for advising Government on urban development.

ii) Details of its nomenclature, location, composition, etc. may be discussed by all departments and agencies concerned with the C.S. and the matter brought back to the Council in its meeting to be held on 2-3-1965.

As a result of these decisions, a high level meeting of related secretaries was held on February 27, 1966, with both the Additional Chief Secretaries. It was decided that to start with, instead of an Urban Development Authority, a Directorate of Urban Development be created within the Works Department, and all the staff and equipment of the Town and Country Planning Scheme should be transferred to this Directorate.

On October 18, 1965, the Planning and Development Department of the Government of East Pakistan issued a Memo [No. 2129 (75)/P] in which the Additional Chief Secretary Development outlined the function of the new Directorate :

'A new Directorate of "URBAN DEVELOPMENT' has recently been created under the Works, Power and Irrigation Department, with a senior officer as the Director having the rank and status of (*ex-officio*) Secretary of the Department.

The functions of this Directorate are as follows :

1. To advise Government on Physical planning matters and also to advise autonomous bodies if they so desire.

2. To prepare an outline plan for the province. This plan will illustrate the present regional structure and urban hierarchy and also point out the probably proposed locations and status of urban centres in the province. To prepare such a plan the Directorate will need to :—

   a) Collect relevant maps, charts and other informations from all Departments and autonomous bodies engaged in Development activities generating urbanization.

   b) Conduct physical and socio-economic surveys in selected towns and proposed urban centres.

3. To prepare master plans of selected centres in the light of the outline plan mentioned above."

In terms of this Memo the Director of Urban Development was to collect a considerable amount of material and information from the various departments of the Provincial Government, which were enjoined to provide him all possible co-operation for this purpose. These data and information would form the basis of the schemes to be prepared by the Directorate.

Since then the Directorate has been operating with a modest staff transferred from the Old Town and Country Planning Scheme under the guidance of an officer with the rank of the Provincial Secretary.

The Directorate is supposed to work under the overall policy control and guidance of an Urban Development Council which has yet to be created. The original project proposals had suggested the following :

1. The Provincial Government shall establish an Urban Development Council whose function shall be to advise the Government on all matters related to the aims and objects of this project as set out in the Preamble, and on the preparation of Five Year Programmes for the physical development of the Province.

2. The Urban Development Council shall comprise a Chairman who shall be the Additional Chief Secretary (Development), and such other members as the Provincial Government may appoint as representatives of those departments and agencies of Government which are closely concerned with the physical development of the Province.

3. The Council shall meet not less than four times a year. It may advise the Directorate on any matters relating to the Plans for Urban Development in the Province and after each meeting it will report to the Provincial Government on the matter discussed.

4. The Council may appoint any committees it thinks necessary to assist it with any aspects of its work.

5. Each member of the Council and of the committees appointed by the Council shall be entitled to receive such fee or allowance for attending the meetings of the Council or Committees as may be prescribed.

6. The Director, Urban Development Directorate, will serve as the Secretary of the Council, and the Directorate will perform all staff

functions necessary for such work and in connection with the meetings of the Council.

d) Special Fund Project: "Location and Planning of New Cities in East Pakistan"

The new policy for urban development as adopted in the new project is now in operation in East Pakistan. Details of the policy, the project and its substantive contents are described in a printed study called "Location and Planning of New Cities in East Pakistan", a brief summary of this document follows.

The Government of East Pakistan has recently created an Urban Development Directorate in order to guide the existing and future urban development of the Province along scientific and systematic lines. Although this Directorate is located within the Works Department, because of the nature and scope of work of the Directorate, the Government has also created an Urban Development Council under the chairmanship of the Additional Chief Secretary (Development). The Council is composed of Secretaries of all the related departments as well as heads of other related agencies and institutions. The Urban Development Council will provide leadership and guidance to the Directorate for all policies and plans of existing and future urban development of the Province. The Council shall advise the Government on all matters related to urban development as well as the Special Fund project for location and planning of new cities in East Pakistan. The Directorate will serve as the Secretariat of this Council. In addition to the present duties, it is also contemplated that this Directorate may be represented on the existing Central and Land Allocation Committee and that the Provincial Planning & Development Department may also consult this Directorate for all those development schemes and projects which have a direct relationship or bearing on urban development of the Province.

In order to carry out its work systematically and along scientific lines, this Directorate is being assisted (upon request) by the U.N. Special Fund. The Special Fund assistance has been approved after the submission of specific project (Location and Planning of New Cities in East Pakistan) by the Government of East Pakistan in consultation with the Government of Pakistan to the United Nations. This Project is based on an approved ongoing scheme called "Town and Country Planning". After the approval of the Project for technical assistance, the U.N. have now appointed a Project Manager-cum-Chief Advisor who has been working with the Government of East Pakistan for approximately seven months. The complete official status of the Project can be fully understood by going through the

Town and Country Planning Scheme, the request of the Government of East Pakistan to the U.N. Special Fund and the final Plan of Operation prepared by the Government of East Pakistan in consultation with the United Nations and submitted to the U.N. Special Fund for their final approval.

The work to be done :

I. Collection of data, research, studies and analysis.

II. Preparation of an Outline Physical Development Plan for the Province of East Pakistan and identification of areas or sites or centres for urban growth. Presentation of the Plan to the Government, its approval and adoption.

III. Selection of 2 or 3 areas or sites or centres. Development of the approved Plan and preparation of Plans for the development of the same as New Towns. Presentation of these Plans to the Government for adoption.

IV. If approved and desired by the Government, further detailed planning and designing of these New Towns, may be taken up for actual implementation. (This will involve land acquisition, planning, engineering works and all other development etc. related to the implementation phase.)

Along with the work mentioned above the Project will also present to the Government clear-cut proposals for organization of an effective and appropriate Urban Development Institution for the Province as well as an appropriate legislation for guiding and controlling the physical development of the Province.

The whole project will cost approximately Rs. 1 crore and 15 lakhs, out of which the U.N. Special Fund will provide approximately 1.1 million in U.S. Dollars and the Government of East Pakistan will provide approximately Rs. 6.17 million as its counterpart contribution. The project is included in the Third Plan at a total cost of Rs. 1.15 crores (Rs. 11.5 million). Allocation for this and other minor projects for physical planning will come out of the total allocation of Rs. 1.5 crores (11.5 million) as agreed upon with the Government of East Pakistan under the sub-sector Basic Development. The balance allocation of Rs. 35 lakhs (3.5 million) is meant for other minor physical planning schemes.

This project will achieve the following physical targets during the Third Plan period :

1. An Outline Physical Development Plan for the Province (based on research, studies and analysis) with identification of sites, or areas or centres for future urban growth.

2. Not less than 2 to 3 Plans for New Towns, selected out of the Physical Plan of the Province, on basis of appropriate criteria and priorities.

3. An appropriate operative Institution for urban development as well as legislation for physical development control and guidance at the provincial level.

e) FUTURE PROSPECTS:

Pakistan's Third Five Year Plan has been formulated within a conceptual approach which conceives of physical planning as a part of national and regional economic planning. The Plan recognizes the causation of physical planning problems by economic development, and, therefore suggests approaches for formulating systematic policies of population distribution in harmony with the distribution of productive forces and development of natural resources.

Economic development has concrete manifestations in space, as it involves changes in activities and their spatial relationship. Establishment of an economic activity, say a factory, entails parallel investment in public utilities, roads, transport facilities, houses, sanitation, schools, hospitals, etc. As in many cases these investments are not seen as an aggregate or co-ordinated by a physical plan, the total capital requirements are underestimated and hence the physical environment starts to deteriorate. Although in one hand the establishment of a factory contributes to economic growth, but on the other as regional and local physical planning aspects and investments are not coordinated with this economic policy in advance, the results of this economic growth do not necessarily bring about welfare and development of desirable physical environment.

Within the framework of regional plans, detailed physical development plans will need to be prepared for urban and rural communities. The Third Plan recommends a number of clear cut policies and envisions important new departures, demanding bold and imaginative action. For the first time the Plan focusses attention on regional and local problems and thus adds a regional dimension to the development programme. The new institution of "Basic Democracies", has to be duly integrated in this approach, and the Plan provides for a more extensive and intensive utilization of the potentialities and resources of the people and local and regional institutions. As a first step in this direction, a unique project in East Pakistan being executed with the help of the United Nations Special Fund has been mentioned in this paper.

A project for Regional Development of Peshawar Valley is being finalized. Efforts are underway to initiate another project under sponsorship of Rural Works for rejuvenating a depressed area, called "Project Boot-strap". A number of Urban Development Plans will also be prepared for developing centres during the Third Plan period.

Appropriate legislation is necessary for the development of regional and city planning in both wings as well as the establishment of suitable administrative machinery for preparing and implementing regional plans. The ambitious plans for economic development will create serious problems of physical planning. To give one example; during 1965-70, if the plans for economic development of East Pakistan are fulfilled, East Pakistan will need at least 100,000 acres of additional urban land (excluding land required for regional functions). In terms of present day prices, this amount of developed urban land will cost 600 crore rupees (6000 million Pakistani rupees). The Government or the people do not, and will not have such resources, so naturally slums, urban and rural decay and chaos will prevail. This can only be prevented by comprehensive regional planning. In order to launch such a programme, besides legislation and administrative machinery, a substantial amount of mapping, surveys and collection of data is necessary. Besides this purely scientific exercise, the planners will have to give some thought to an appropriate reception and integration of incoming rural immigrants into urban life.

If the difficult problem of the integration of the former rural inhabitants into an urban society are sufficiently realized by the planners, then they will be forced to seek solution which cannot be found in any text-book of city planning. Satellite towns are definitely not the answer. New solutions must be developed which take into consideration the particular aspirations and tradition of the people. Perhaps the answer lies outside the city in the rural environment itself. Perhaps new type of town should be developed—a town which is neither entirely urban nor entirely rural—a town which is midway between the village and the city and can absorb the overflow from the land without forcing the people to change radically their mode of existence. It is certain, however, that such solutions cannot be implemented unless the physical planner finds his rightful place in a position of authority. In order to effect useful changes, legislation must be effected, the administrative organization changed, and new institutions created. All of these are vitally necessary for the welfare of the country. There must be an awakening consciousness of the need for both urban and rural planning on a regional or even national basis. It must not be thought that economics alone determines the pattern of development. There are many cases where immediate economic considerations must take a back seat to long range planning objectives. Unless this is realized, there will be a

danger that the new development may turn out to be a nightmare instead of utopia. Not only the professional planner needs to be given more authority, but the people themselves must be involved in the planning and implementation process as far as feasible.

Finally coming to more substantive and technical aspects, we would like to mention a few points. These are the problems of regional and urban administration, urban land policy, and a clarification of our goals for urban development.

If the situation is looked at against a perspective from five to seven years it is clear that a great deal has been achieved. Town planning has been firmly established, a separate department for water and sewerage has been set up and is operating actively, there is a Housing and Settlements Agency, towns and villages generally seem to be in somewhat better shape than earlier. In speaking of achievements reference must be made particularly of the construction of Islamabad. What has been accomplished in a span of four years is little short of amazing. It clearly demonstrates that given the will, the nation is quite capable of mustering the organizing capacity and skills necessary to carry out the most complex technical tasks. Lack of achievement in some other fields with which this note is concerned is in sharp contrast to the progress at Islamabad. Why the difference? Are we attempting to carry out more than can be accomplished with the organizing skills that are available or is insufficient interest being shown at senior levels to make sure that the work succeeds.

This observation relates particularly to land preparation for low cost housing. It does not reflect much credit on the Nation that land can always be prepared for Pakistan Employees Cooperative Housing Societies, Gulberg[1] and for government servant housing but that so little is being done to make land available for other middle and lower income groups. Land can be found for industry but factories are no more important than the people who work in them. Why are we so unconcerned about land for worker's housing ?

If the energy and determination that is evident in the Capital Development project was found in other agencies responsible tor land development, the ordinary people ot Pakistan could go a long way towards solving their housing problems for themselves. Credit for the poor achievements lies only partly with the authorities which have these powers—the Housing Agency, the Improvement Trust and the Municipal Committees. It also rests heavily with the Commissioners and the Secretaries who are responsible for development of districts or sectors of the five year plan. These are

[1] Localities in Karachi and Lahore where comparatively more affluent sections of the populations live. (eds)

the people who have the powers to inspire the agencies, secure staff for them and insist that programmes are carried out.

We in Pakistan still think of a city and regional planner as a sort of "City Beautifier" or a kind of a "Map Maker" who finally produces an all inclusive map for construction of houses, schools, shopping centres, etc. This archaic concept of a City and Regional Planner has since long been abandoned in the modern world. A present day city and regional planner is trained on an inter-disciplinary basis (both in natural and social sciences as well as in techniques of management and administration) and specializes in physical planning at local and regional levels. His basic tool is land use analysis and planning for harmonious growth of communities, cities and regions. He is trained in the art of team work with industrial and economic development experts as well as in the technique of translating economic and social policies into orderly plans and programmes of physical growth and development. Unfortunately the few city and regional planners in Pakistan are as yet not being utilized in an appropriate manner while the actual work of city and regional planning is being performed by Deputy Commissioners and Commissioners (although they are not conscious of it themselves). This simply clarifies the problem that our few qualified planners are either not being utilized properly, or are under-utilized (being kept busy with mundane, routine matters, or their function is usurped by others, simply because they are too timid or afraid or unwilling to assume it fairly and squarely). It is therefore urgent that in any scheme of Regional and Local Management, the role, functions and heirarchy of the trained physical planner should be clearly defined, not on his personality basis or his political or family connections, but simply on the basis of the profession and its relationship and needs in the development programme.

Used in this way physical planners will become tools which enable those who are master-minding the development programme to make better informed and sounder decisions. The plans must not be prepared in a detached way by some officer working in a corner. They must be prepared under the nose of the Deputy Commissioner and the Municipal Committee.

It is not possible to carry our development effectively without thinking where things should go and how they relate to each other. At the field level there must be an integration of the work in various sectors. Each Commissioner should be asked to take responsibility for seeing that he has a plan showing the location of all major projects in his district and master plans of all major urban areas to be used to guide decisions about location of projects in the future. Legislation should be enacted to provide powers necessary to prevent private developers flouting the community interest.

The President of Pakistan in a note sent to the Planning Commission has drawn attention to the importance of physical planning of this type. A target for the Third Plan could be (*a*) the preparation of plans showing the major resources and the location of project in each division and (*b*) Master Plans of each of the towns over 50,000 or with a growth rate in excess of 5 percent.

Coming to the institutional arrangements, we are facing a very paradoxical situation. Slowly and steadily we have stripped the Municipality of all its functions by creating separate Water and Sewerage Authorities, Development Authorities and what not. While the Urban organism itself is a unified single entity, it is pulled in all directions not only by the municipality and the improvement trust by several other units of our government. This is a major road-block in implementing any programme. One good solution may be to expand the municipal boundaries over all those areas which may become urban in coming 15-20 years, and restructure the municipality into four major divisions; planning (short and long range), designing and implementation, maintenance, and the last division to cover all other work. However, if the government and the people think that local government does not work, and it is an undesirable institution, then it is better to merge it within the regional administration, instead of keeping just a facade. Municipal functions, finances, personnel (their quality and performance) and management are in a deplorable state of affairs, essentially because we have not given much attention to them except to strip away various functions. Time has come that we must "temper the wind to the shorn lamb" or sacrifice the "lamb" at the altar of more effective regional government.

Coming next to urban land policy, the present situation is even more alarming. Urban land is changing hands in Lahore at Rs. 17 lakhs per acre and in Dacca the situation is even worse. A select imaginative group of persons in various cities is reaping rich benefits by increase in land values due to public and community investments. We are either oblivious to this phenomenon or do not possess adequate tools to deal with it. In Denmark, for example, the government imposes 4 to 25% tax on increase in land values. Because we are still dealing with the problem on a piecemeal basis, we have not achieved much. The present day planner is perhaps too practical. When the traffic becomes heavy, he widens the street and still more traffic pours in. When land values increase, he zones various structures. When slums appear, he clears them piecemeal. Urban conditions cannot be cured in this superficial manner. We must unearth the roots of the evil, and then have a systematic programme for comprehensive planning on regional and then at local level.

Last of all we must mention the need for clarification of "Goals" or "Objectives" for urban development in Pakistan. Let us not get bogged down so much by means and methods, unless we have first clarified our goals. First and foremost, we must understand the established fact that economic development by itself does not produce a desirable physical environment and secondly uncoordinated and unhealthy growth is not inevitable. The present state of our cities, villages and communities is a true, and perhaps a blatant visual picture of not only our values but also the scale of priorities that we as a society have, within our value structure. A poor man by spending a few paisas can smoke till he gets lung cancer, and in the process enjoy a temporary dose of romantic or Freudian song and dance by visiting a cinema hall, but he cannot with the ease have access to commodities like a decent house, pure water and adequate arrangements for excreta disposal etc. This is so, not because the Government or the Planning Commission is at fault. The fault lies in the value structure. For example, we possess excellent values of personal cleanliness, but as yet we have not evolved clear cut civic values. This again is linked with the whole concept of lack of an overall perspective. Our cities reflect the status of our civilization, and if we read through these symbols, then from the glorious cities of the Moghuls, we came down to the "Civil Lines and Cantonments", and since then although we did try in Thal and other places to have some new towns, by and large, we have ended up with slummy socalled satellite towns, a few fashionable residential suburbs, and a vast rapidly growing mass of slums. Efforts to solve the problem by dictation and a public works approach, as in case of Korangi at Karachi and possibly Lahore Township, are simply hedging the issue. Korangi has proved to be a costly mistake, and has been handed over to Karachi Development Authority for a post mortem, and a complete renewal within its own framework. The Lahore Township looks bright and promising on paper, but real results have yet to be seen.

The crux of the problem is that we do not have any clear cut goals for urban development. We are not even clear what are the possible alternatives for urban development. Briefly there are three situations :

1. A mystique of back to village movement or back to nature nostalgia, which was propounded in the Indo-Pakistan sub-continent by the Ghandian and other later day movements, writers and artists.
2. A "boy scout type" effort, by the architects, city planners, government officials and city lovers and reformers, to prepare master plans, or beautify their cities by planting trees and fountains (beautiful or ugly !) or exhort the city dwellers to clean up, paint up and what not.
3. An isolated, but perhaps dedicated effort by the government to build new towns as a part of the national and regional development,

programme; as reflected in Islamabad, the Ghulam Muhammad Barrage Project and the new Special Fund Project in East Pakistan.

The last situation offers some hope, but will only be successful if we clarify our goals for urban development as a part of the national development policy. So far in this effort, our National Planning Commission has performed the role of a trail blazer or perhaps a catalyst. But the solution does not entirely lie with the Commission or the Central or Provincial or local governments or any new bureaucracy. The essence of the solution lies with the people and in the people themselves. Our society, with its ancient and well-tested mainsprings, has created glorious cities and physical structures and monuments.

Because of a lack of focus and clear cut goals, the overall efforts are somewhat confused and unco-ordinated. Once the society sets its goals, like the family planning programme, there is no reason why we should not have a sound and dynamic programme of regional and urban development.

Urbanization in Pakistan: A list of the Problems

MOINUDDIN BAQAI

Urbanization is a name given to a multitude of changes in the pattern of organization of a society. Urbanization is not only a movement of people from rural to urban areas, it is simultaneously a movement in the case of underdeveloped countries from the traditional to the more progressive and modern sector of the economy. The traditional society preserved itself generally in the self-contained economy of the village. The urban area in a traditional society was really an extension of the village. Apart from a few metropolitan areas, the town was no more than a larger rural areas. Today the city has acquired its own social personality and identification which is not necessarily rooted in the village. There is a reserve influence of urbanization where forces have been able to penetrate the defensive mechanism of the village.

This identification of the trend towards urbanization with the process of modernization and industrialization needs further investigations. Fundamentally, it has to be realized that what is involved is a complete change in the pattern of life.

A man moving from the village has lost not only a home and an assured job, but has been cut off from the system of social security which operates through the extended family and collective village responsibility for its inhabitants. A new social arrangement is necessary to help him find a fresh equilibrium in his life and to be able to live as a constructive element of society.

The problems created by urbanization are so complex and varied that either they are neglected or a reaction is created in favour of slowing down the process. While neglect of the problems of urbanization has been common feature of almost every developing society the worst example was perhaps the early period of industrial revolution in the U.K. Furthermore, in the U.S.A. the problem of cities has only recently started getting the attention that it deserves. In the U.S.S.R., the problem of housing for workers was also relegated to the background in the early period of its industrialization.

One is inclined to wonder whether the neglect of the problems created by urbanization in the process of industrialization is the necessary or inevitable cost of industrial progress. If a country was to count the entire cost of developing the cities properly in relationship to that of setting up new

industries, probably there would be more of an attempt to go slow down the speed of industrialization.

But the answer does not lie in trying to slow down the process of urbanization. As explained earlier, the only measure that can slow down the process of movement towards the cities, apart from trying to arrest all progress and change, is an attempt to urbanize the rural areas themselves.

Urbanization appears to be continuing at a high pace, though probably with the rapid development of agricultural sector the rate may slow down. If urban growth continues at 50 per cent for each decade, the urban population will constitute roughly 20 per cent of the population by 1985.

While the bulk of the population of Pakistan would continue to live in villages for the foreseeable future, a doubling of urban population over a period of 12 to 15 years would require that the problems of the expanding urban areas be tackled with care and deliberation.

The multifarious problems created by the process of urbanization in the sense of concentration of large chunks of population in compact units can be conveniently grouped into three categories.

The first group with which economists are generally concerned includes the problems of maintaining a high level of employment and economic activity in these areas coupled with adequate supply channels to meet the demands on economic goods and services. For this reason it is essential to study the pattern of urban consumption and to see that marketing apparatus grows in line with the demand pattern to meet the requirements of the population. To illustrate this point, there is a general concern about the increase in prices, particularly those of essential consumer goods, such as dairy products, meat and vegetables. These items are produced in the rural areas. The larger an urban area becomes and the further removed it is from a surrounding agricultural area, the more complex becomes its problems of maintaining food supply links. For example, milk supply for any city requires working out detailed arrangements for the development of dairy industry, transportation of milk, and its distribution etc.

Much of the complaint in Pakistan in urban areas is due to the inadequate development of such marketing and distribution arrangements with regards to the essential consumer goods. It is generally observed that for the smaller towns the supply of food is more adequate and available at reasonable prices. The price differential of essential food items between large and small towns reflects the inadequacy of marketing arrangements.

The economists are also concerned with the overall problems of development of urban areas with a view to providing adequate housing as well as adequate land for commercial and industrial enterprises. It is essential that

industrial location is planned in such a manner as to allow for an orderly development of residential, commercial, and industrial facilities.

At this point the problems with which economists are concerned overlap with those confronting architects, engineers, and town planners. The zoning of the city and development of various areas for the extension of the city must coincide with the industrial location policy of the government. Within these overall requirements the town planners and experts of physical planning have the important task of developing the city as hygienic and pleasant surrounding for the healthy and comfortable living. Their task is rendered difficult by continued influx of population from the rural areas.

An important element in town planning is the provision of basic amenities which are essential for urban living. These include public utilities such as water supply and sewerage which are considered as part of town planning proper and the domain of local authorities. It however also includes certain other facilities which are equally essential but which are planned on a national basis. Examples of this category are the electricity, the supply of gas, the transport system within the city limits, and other similar facilities. It is essential that while for certain purposes national planning of such services may be continued, these efforts must be integrated into comprehensive city plans at the local level. Lack of coordination in these areas results in a phenomenon such as the digging of roads by various organizations at different times of the year and duplication of activity. The framing of master plans for integrated long term development of such facilities is not enough for what is needed is a much greater coordination of activities in the area of urban planning which suggests a further strengthening of the local administration.

A third set of problems lies in the domain of sociologists and social workers. The movement of an individual from a well-established and integrated rural society to urban areas where community living has not developed and state care of the individual has not replaced the care exercised by the family and the group creates considerable insecurity and tension. The existence of a large number of people in urban areas deprived of their moorings in the village society results at times in a lack of social responsibility on the parts of individuals and leads to behaviour patterns which may not be conducive to a stable society. The intensity of these problems can be considerably reduced by proper planning of the physical environment.

There is an inter-relationship in the types of problems listed above as arising from the process of urbanization. They are being dealt with in different types of planning efforts at different levels. In underdeveloped countries generally, and Pakistan is no exception, there is very little coordination and cohesion in these efforts. The result is the growth of problem cities like Calcutta in India and potentially Karachi in Pakistan.

Push Forces in Urbanization

Z. Birjis

Introduction

One of the international effects of industrialization has been a movement towards urbanization, which means, to a large extent, the transference of rural population to cities. The importance of this movement is apparent from Latin America to Japan. Pakistan is no exception. Although ours is an agricultural country and the bulk of population still resides in rural areas, in recent years a persistent and accelerated trend towards urbanization is clearly visible. The easiest way to verify this is to take up the census figures of the recent years.

"The ratio of urban population to the total population increased from 4.9% in 1911 to 10.4% in 1951, the actual urban numbers rising from 2.5 to 7.9 million. During the decade 1951-61 there was a further increase of urban growth. The percentage of urban to total population went up to 13.1, whereas the actual number of urban dwellers increased to 12.3 million."[1]

This trend towards urbanization concentration has its main effects in large cities. With the exception of Sialkot, all the cities recorded an increase of no less than 25%. Some of the larger cities have registered dramatic gains. During the 1941 to 1961 period, for instance, Lahore swelled from two-third of a million to around 1.3 million. Again certain figures go a long way to prove this. Out of the total increase of 57.4% in the urban population over 1951 figures 38.4% is accounted for by 16 cities, and 21.9% being contributed by the four big cities (Lahore being one of them).[2] Since Lahore is one of the four big cities of Pakistan, its contribution towards urbanization is quite significant.

The above mentioned figures prove to the point of certainty that there are irresistible forces, both patent as well as latent, which are accelerating urbanization.

There is no doubt that urban growth could be attributed to the rate of natural increase of population within the cities, but the rapid growth in

1 Population Census of Pakistan 1961, Vol. 1, figures drawn from statement 2.17

2 *Ibid.*, Census Bulletin No. 2, p. 13.

urban concentration is certainly due to migration from rural areas. The rate of growth of population and the rate of increase in urban population are indicative of this trend of rural-urban migration. "A number of urban areas have been gaining in population far beyond what might have been expected from natural increase alone, whereas not a few rural areas have been losing population more or less constantly".[1] Though the exact extent of rural-urban migration is not ascertainable, its role in urban growth of the country is vital.

The forces that impel village population towards the cities are numerous, and vary from time to time. In the past, war, epidemic, famine, floods, etc. have played a role in urbanization. But there are some forces which consistently and clearly exercise an uprooting effect upon the villages. Among them economic reasons, political considerations, social gravitation, psychological motivation, and urban amenities play an important part. These forces have a dual effect in so far as they, not only cause rural population to leave for cities, but also they induce them to come to cities. In other words, they simultaneously are push forces for village and pull forces in the cities. Causes inherent in the villages themselves, which lead to migration of the rural population to cities are discussed presently.

Economic Reasons

We firstly touch upon economic reasons, which generally have been held to be the chief factor of emigration of rural population.

In all countries where a rapid expansion of manufacturing and commerce has taken place, a large-scale migration from the country side to the cities has occurred. It is the same in Pakistan.

Since each person tries to better his lot, a prospect of his material welfare is a sufficient inducement for him to go to cities where undoubtedly the standard of living is better than that in the villages. The cities hold not only more glamorous attractions but greater economic opportunities. The villages, on the other hand, have become stifled with the growing pressure of population on land, an increase in rural debt, lack of rural industries and a constant under-employment. In cities industry is an immediate economic attraction for the under-paid or unemployed villager.

The industrial boom has a constant demand for labour and villages are the main providers of this demand. Similarly the specialized needs of a city call for specialists which again may come from the migrant village population.

As against this pull force of the city the system of agriculture and land tenure in Pakistan has a push force on the rural population. It is generally

[1] *Ibid.*, Census Bulletin No. 2, p. 13.

agreed that the system of land tenure may have much to do with the desire of rural population to migrate to the cities. Where much of the land is in large estates and much of the rural populace is a proletariat of poorly paid agricultural labourers, higher wages in urban occupations are likely to furnish a particularly strong motive for migration. This condition of agriculture has in particular accounted for migration of villagers to Lahore.

On the other hand, large number of people from rural areas, where much of the land was occupied by small tenant farmers, have migrated to cities. Divided inheritance may thus give an incentive to migrants where the land is broken up into holdings that are too small to support a family. In Pakistan, the law on inheritance diminishes land holdings. The holdings are reduced to such a level of subsistence that peasants are driven to seek other form of employment. Alternative sources of income are not accessible and therefore they cannot supplement their earnings in the villages. The underemployment in agriculture thus serves as a strong factor driving the population out.

There is another point which is relevant to our system of farming. Farmers are occupied during certain parts of the year, *i.e.*, at the time of harvesting. For a few months they are idle, and obviously enough they like to seek employment on the basis of daily wages in the cities.

The importance of employment opportunities in the cities becomes obvious when one views crowds pouring from countryside like Sagian, Sandha, Nawan Kot, Shahdara, to the city of Lahore on daily wages. The labourers mostly come to Lahore to work from the adjoining villages and return to their homes in the evening. Later some of them settle in Lahore or eventually their village may become a suburb of Lahore.

Psychological Reasons

Economics is usually considered to be the most effective reason in urbanization, yet in my opinion the psychological reasons emanating from a change in attitude are equally important. Attitude is the basic element which moulds life of human beings. It is a proved fact that not every individual, who has an opportunity to achieve a higher standard of living through migration, desires to migrate. It is again not necessarily in the poorest agricultural districts that the impulse to move to the cities is strongest. In many countries the main sources of rural-urban migration have often been areas where the per-capita output of agricultural labour was relatively high. Therefore, economic factors operate within the framework of psychological factors.

It is mainly resistance to change, which is deep rooted in human nature, that stands in the way of improvement. Here improvement is referred to in

relation to migration to the cities. Emotional attachment to a community and to acquaintances, to a culture, or language, to political and social institution, or to a way of life are factors which tend to build in resistance to change and thus inherit migration. This attitude is rooted in the villagers for centuries in the past. The traditions, customs, habits of thoughts, religion, have their tight hold on their minds. These ties have been strong in the past, when the individual more often accepted his environment and social position, and attempted to adjust to these conditions, with little or no thought of seeking better prospects. Here in Pakistan where life is ruled to a large extent by ancient tradition, customs and strong communal ties, such migration has been relatively small.

Now the resistance, built through centuries, has begun to crumble away, and thus has paved a way for a process of change. The hold of tradition begins to loosen, and thus mind has become receptive to new ideas. In the present age one sees appreciable trends of change. The individual has shown greater inclination to strive for a better life by modifying his environment. These cultural and social ties, which make it difficult for people to break away from their native land and begin life afresh, are gradually giving way. With the increase of popular education and the development of trade and means of communication, the contract between people in different areas have increased tremendously, and the knowledge of opportunities in other places, both near and far, has improved accordingly. The media of village aid and Basic Democracy has also contributed a great deal in awakening the rural population.

This change of attitude essentially leads to a desire to improve which probably can be realized by migration to places where opportunities exist.

Social Reasons

Greatly interlinked with psychological factors are the sociological forces which tend to push rural population to the cities. Change of attitude opens new avenues before them, and sociological environment contribute to their realization. Lack of social amenities like education, recreation, entertainment, shopping centres, medical care, and cultural centres are essential motivating factors for villagers to leave their homes. All of these are briefly discussed here.

It is important to mention the conditions of rural life here, because there is essentially something inherent in those conditions which tend to push the population to the cities.

Life in village, which is nothing more than a stereotyped existence, encumbered with custom, traditions and austerity is ultimately a distracting factor.

The onerous demands of well-knit families, of parental authority, of the status pattern, and of hard life of labour, leave no room for individual freedom and development. Hence there is normally a lurking desire in the villager to escape. The limited and restricted rural life offers no personal freedom, nor any channels for self-improvement and self-fulfilment. The freedom of the city, as contrasted with the rigidity of rural moves, increase the attraction of urban life. It is the city which moves with the time, and not the slow-moving countryside, where they can find new forms of self-expression, new chances to develop their latent talents.

Another factor which is responsible for the villagers to leave their narrow and parochial home is their liking for impersonal nature of relationship, so characteristic of city life. The impersonal nature of life pattern provides them with an anonymity which gives them free hand to indulge in their personal pursuits. Probably for this reason even criminals are attracted to cities. The chances of detection are probably remote comparatively and the range of operation is greater. The same is true regarding moral offenders.

The absence of facilities like medical care and effective maintenance of law and order, proper physical conditions, are, in a limited scale, conducive to the migration of rural population.

Lack of educational opportunities in the rural areas are great deterrent for the more enterprising persons. Connected with the desire to improve one's lot is the desire to learn. But as the educational institutions are normally concentrated in cities, an ambitious villager is left with no choice, but to come to a city for education.

Now this has a long range effect upon urbanization. The villagers who receive training are reluctant to go back to their villages. They rather seek intellectually satisfying occupations which hardly exist in villages. Thus they settle, or at least reside in cities, thereby helping urbanization. This, however, adversely effects the already depleted potential of the village.

Another reason which leads to great dissatisfaction with the country life is the lack of medical care. Good and competent doctors are not willing to serve in the villages. There is not only dearth of medical services, but at places, almost total absence of hospitals and dispensaries. Many are the ailments, which if not attended immediately, lead to death. So one can imagine the disastrous effect of such lack of facilities, and the feeling of insecurity which it can cause. This is a potent factor likely to push them to the security of urban life.

Looking at it from another angle one finds the justification for the villagers to be dissatisfied with their rural life. There is certainly less of law and

order in villages than in cities. It certainly tends to make inhabitants feel less secure and there are many who, in order to avoid village feuds and rivalries choose the security of the city.

Since the seat of administration is so far removed from the rural localities, a desire to be near it motivates some people to settle down in the capital areas. Some enterprising and ambitious persons, who want to keep a fruitful relation with administration, find it useful to be in the city. This is specially applicable in the case of Lahore and Karachi.

The countryside is denied many other facilities, like proper housing, electricity, water system, sewage, transport facilities, recreational opportunities.

It would be worthwhile mentioning here that it has been the finding of urban sociologists that it is the young who usually migrate to cities. The young, being more ambitious, are more easily dissatisfied with the village life.

This fact of migration among the youngsters is substantiated by the census figures of 1961. "Urban component between the age groups 10-24 and 25-44 (55.6%) was bigger than the rural (48.7%).[1] This is mainly, if not wholly, due to the city-ward migration of people in these groups.

It is further important to note in this connection that men are more enterprising than women. Women are devoted to their homes, less exposed to the influence of change and, therefore, less keen to improve their lot. Their security and devotion lies in the four walls of their homes. Men seek adventure and livelihood and therefore are driven in greater numbers to the town.

Urbanization of Lahore

The push and pull forces mentioned generally have also gone into play towards the urbanization of Lahore. It is significant to note that about forty years ago the walled city used to be the main city of Lahore, whereas now it is only a slum of Lahore. Parts of town like Gulberg, Model Town, Shahdara, Kot Lakhpath, Mughalpura, Baghbanpura were adjoining villages till a few years ago but now they are integral parts of the city.

Independence of this country has also accelerated the process of urbanization in Lahore. After Partition heterogeneous elements entered here. It bore the main burden of the influx of refugees coming after the riots in East Punjab. In the process of migration many villagers settled in the city, since they found here greater chances of livelihood, and wider scope of absorption.

[1] Population Census of Pakistan 1961, Bulletin No. 3. Figures drawn from Statement 5.

Social Problems of Urbanization in Pakistan

ZUBEIDA MUSHTAQ

The process of urbanization in Pakistan has evolved through three distinct phases. We have the Ancient and Medieval phase in which cities cropped up mostly by riverside. These, incidentally, by virtue of their importance became permanent religious and educational centres and drew large numbers of devotees, students and sçholars. Business thrived there because of the constant influx of people towards such cities.

The Moghal and British phase may be considered to be the second important phase of urbanization which reveals distinct city planning and building techniques. Light and cheap industries (which did not come in conflict with the imperial interests) were set up in some of these cities during the British period, and this led to migration of the rural population to urban centres in which these industries were located, employment being the chief source of motivation behind this migration. Another pattern of cities emerged in the form of port cities like Karachi and Chittagong, which by virtue of their geographical location became flourishing commercial centres.

The post-Independence period may be termed as the third distinct phase in the evolution of the urbanization process in Pakistan. The enormous increase in population through migration and rapid birth rate posed a formidable problem for the city builders and town planners. The old cities could not accommodate the new nation. Refugees swarmed to the already overcrowded cities since these alone appeared to offer a promise of providing a livelihood. Industries grew in urban areas thus attracting still larger numbers of people to the already teeming cities. Settlement of the displaced, shelterless families coupled with planning for economic development and industrialization was a whole-time job for the Government. Increasing urbanization was an inevitable result of more industrialization and other marginal factors. The enormity of the situation may well be estimated by the following table:

TABLE 1

Increase in Urban Population in Pakistan 1950—65

Year	Total Population	Total Urban Population	Urban Population as percentage of Total	Annual Rate of Urbanization
1950	78,800,000	7,780,000	9.9	
1960	98,880,000	12,610,000	12.75	5.0%
1965	112,400,000	16,480,000	14.65	5.5%

The above table shows that in 1950 barely 10% of the population lived in urban areas. In 1965 this percentage had increased to approximately 15%.

The process of urbanization has not been confined to the already established urban centres. There has also been a rapid increase in the number of cities. The following table gives an idea of the distribution of this increase during one decade.

TABLE 2

Growth of cities in Pakistan 1951—61

Year	Total No. of cities	Cities of 100,000 persons	Cities of 50,000 to 99,000 persons	Cities of 25,000 to 49,999 persons
1951	56	11	9	36
1961	76	16	15	45
Addition in ten years.	20	5	6	9

It is clear from the above table that in 1951 there were 56 cities with a population of more than 25,000 each. In ten years' time this number increased to 76.

This general trend towards urbanization has resulted in a backlog of dwelling units in cities. Expansion in house-building has not kept pace with the increase in urban population. This is evident from the following table which depicts a backlog of 950,000 dwelling units in 1965.

TABLE 3

Urban needs and achievements 1960—65

	Backlog in 1960	New Needs 1960—65	Total needs 1960—65	Second Plan achievement	Balance backlog June 1965
1	2	3	4	5	6
All Pakistan urban areas.	600,000	500,000	1,100,00	150,000	950,000

It is clear that living conditions in urban areas do not show much signs of improvement despite the government's very serious efforts in this direction. Conditions have actually deteriorated on account of population growth and expanding urbanization. Rural migrants to the cities, finding it difficult to procure accommodation, construct temporary hutments for their shelter. These hastily constructed hutments usually consist of sub-standard dwellings without any of the essential amenities of life. Such localities become the breeding grounds of social dissatisfaction and unrest on account of congestion and slum conditions. This phenomenon retards socio-economicdevelopment. Housing and urban development are in fact activities where social and economic progress meet. These two provide the physical framework in which man's human, social, economic and cultural resources are released, enriched and integrated. All-round urban development therefore is a matter of prime importance and utmost concern for those at the helm of affairs, as it goes a long way towards creating or retarding employment and economic growth, in maintaining health and social stability and in preserving the value of a decent family life.

Definition of Important Concepts in the Title

Before dealing with the problem itself it would be advisable to begin by defining certain terms.

The term "urbanization" has a dual significance and is used in conflicting senses in ordinary language. For the means the purpose of this paper, urbanization proportion of total population which lives in towns or urban areas within a specific unit. The important thing to keep in mind is the degree of urbanization in a particular country, irrespective of the type of towns it possesses. It is this degree or proportion which in one way or another figures in relation to other economic and cultural phenomena in a particular country at a given date. Thus, urbanization, though first and foremost a demographic phenomenon, when viewed in a wider context is also one of the major aspects of the larger process of economic and social development, which affects both rural and urban areas, and implies, among other things, the necessity of population shifts to new ways of life and work.

Urbanization, to quote the *Encyclopaedia of Social Sciences,* is characterized by movement of people from small communities, concerned chiefly or solely with agriculture, to other communities generally larger whose activities are primarily centred in government trade, manufacture or allied interests. This movement of people from one pattern of living to another entails a change in the social structure. This adjustment does not take place at as rapid a pace as the change itself. Some elements of society change faster than others. This differential character of social changes creates situations for which people have to work out solutions. In order to achieve this end, they

may have to deviate from the patterned modes of behaviour, so as to cope with the situation arising out of the changed conditions. This is a situation for which their previous experience has not prepared them. This brings us on to the second major concept in the title, *viz.*, social problem.

Social problems are the result of our efforts to adjust oneselves to new situations in ways that do not carry the sanction of traditional group norms. Social problems arise because of the disparity in the rate of change between the various elements of society. Conditions emerge that pose a challenge to the prevailing modes of behaviour and the values that define it. Behaviour deviates from the institutional norms and people begin to act in a way they are not supposed to. A social problem may therefore be defined as a condition believed to threaten a social value and conceived to be capable of betterment by constructive social action.[1]

A social problem, thus, involves:

(1) A social situation,

(2) the value judgment,

(3) the appropriate social action.

It is supposed to come into being when a large number of people consider a situation to be undesirable, as being both contrary and injurious to some value that the society considers important and about which the majority of the members of the society feel that some form of collective action may eliminate or at least ameliorate the undesirable situation. Jessie Bernard, a noted authority writes in a somewhat similar strain: "Social problems are situations which for humanitarian, utilitarian, or dysfunctionality reasons are felt to demand positive, usually reformistic action on the part of society."[2]

Viewed in the light of the two above-mentioned definitions of Social Problems, we have now to consider what factors in the process of urbanization in our country have been productive of social problems. As stated earlier, Pakistan has been undergoing relatively rapid urbanization for the last two decades. There has been mass migration from the rural areas and heavy concentration of the urban population in large cities. In rural areas, as we all know, there is a considerable excess of manpower without corresponding means of employment. Cities appear to be a reservoir of job opportunities because of their being the centres of economic development and industrialization. Urban attraction is compared with rural deficiencies, while industrial development attract more people to cities than are able to

[1] E. Merrill, *Society and Culture*, Prentice-Hall, Inc. Englewood Cliffs, Newjersey 1961, p. 543.

[2] Jessie Bernard, *Social Problems at Midcentury*. Role, Status and Stress (New York : Henry Holland Company 1957) p. 70.

earn their livelihood there. Most rural migrants expect to find in the city not only a job, better housing and physical amenities but also a richer social and human experience. What they actually come across is inadequate supply of housing and other communal facilities. Urbanization has proceeded at a far more rapid rate than services can be expanded to meet the essential needs of the citizens. Since human and material resources are inadequate to deal with the problems which inevitably arise, it becomes difficult to decide how best these limited resources should be allocated to meet conflicting demands.

Moreover, the social problems of urbanization in our country have assumed complexity and magnitude because of the fact that we are changing from a subsistence to a money economy, from primitive agriculture, handicrafts or cottage industry to large scale industrial and commercial activities, from tribal to national loyalties, from the expanded family to the conjugal unit and from traditional forms of political life and administration to modern ones. All these factors go a long way towards aggravating the existing situation in urban areas—a situation which requires amelioration at the hands of members of society. Judged from this standard, urbanization in Pakistan may be regarded as assuming the propensities of various social problems. An attempt has been made in the following chapter to figure out some of these problems.

STATEMENT OF THE PROBLEM

Social problems are inter-related with social and personal disorganization resulting from social change. Urbanization is a social change requiring changes in the pattern of living. Housing, congestion, crime, unemployment etc. are some of the social problems which could be the offshoots of increased urbanization. This change causes dislocation within and at times disintegration of the social system. A dislocated social system in turn affects the normal behaviour patterns, values, attitudes, beliefs and mores of the members of society.

Before taking up the social problems of urban communities it would be better to look cursorily at the effect of urbanization on non-urban areas. Some people think that the impact of urbanization in Pakistan on non-urban areas is almost negligible; while others believe that urbanization is imperceptibly, but surely, bringing about a transformation in the rural life patterns. Urbanization in Pakistan has, however, not so far become a country-wide phenomenon. Non-urban communities in Pakistan have continued to be predominantly agricultural in character. But the fact remains that the process of urbanization has left its marks on rural life. The changes in agricultural methods and the shifts in rural population have had some impact on the institutions serving farmers' needs. Rural institutions are falling behind in fulfilling some of the vital needs of rural people in many areas. Lack of

technical help for the mechanized farming implements, and of educational, health and recreational facilities, added to ineffective economic institutions such as banks and merchandizing facilities, are some of the glaring examples. The result is an increased trend towards urbanization. More and more people have started deserting the countryside, as much for better opportunities for health and education and recreation as in order to escape farm work.

To return to the social problems of urbanization in cities, we find that perhaps the most formidable and certainly the most visible problem of urbanization in Pakistan is that pertaining to housing and physical environment. Low income families are unable to obtain decent housing with adequate amenities, especially water and sewerage. People live in conditions of overcrowding and ill health, huddled together in squalid and insanitary surroundings. Migration continues unabated and the new city-dwellers find it more and more difficult to afford the rising cost of housing. They are crowded together in the slums of big cities. The term slum connotes extremely bad structural and sanitary conditions. Their occupants belong generally to the lowest income groups.

Overcrowding in slums leads to low standards of public health, delinquency and dependency. There are no recreational facilities and playgrounds for the children, no healthy pursuits for the grown ups. The result is a negative attitude towards the normal ethical and social standards of life. These people are liable to show disrespect for, evasion of and disobedience to the law.

Not only that such living conditions cause imperceptible damages to the society at large, people who swarm there are generally degenerate and inefficient workers because of the fact that they are constantly suffering from sickness, mental ailments, shiftlessness and poverty. This inefficiency at work leads to low earning capacity and results in low purchasing power. Small and irregular wages result in low consumption. Low consumption weakens the normal consumers' market. This serves as a deterrent factor towards the normal improvement of the socio-economic condition of the population in general and thus retards the pace of progress in the country.

From physical environment we now pass on to family. Family as an institution has suffered a great change as a result of urbanization. Families migrating from rural areas to cities may lose their cohesiveness. In a rural setting family members may have been working together at a joint enterprise; their interests were perhaps directed towards a common goal. In the city, however, they are liable to lose these primary familial contacts because of various factors. In the first place family has perhaps broken up in the

process of urbanization. It has shrunk in size or has dwindled considerably, consisting, now, of father, mother and the children. The more expansive contacts of joint family, thus, loosen their hold over the individual. Secondly, if more than one member of the family is working their places of employment may be separate. Their working hours may be different. The people they come across may be coming from different groups or sections of the city. Diverse or conflicting influences may thus weaken some of the family ties. Thirdly, family integration and interaction may also suffer from various competing activities outside the home. The tempo of city life with its rapid means of transportation and communication stupifies the new migrants. They undergo greater physical and ideational mobility. They come across more complex ideas, values and modes of behaviour. Thus, informal social controls exercised and strengthened by primary face to face contacts with members of the expanded family, neighbours or community leaders slacken and lose their grip on the individual's mind. Stemming from the above factors is the inevitable result that families in urban areas lose their familism. Familism may be taken to mean that the welfare of the family is more important than that of the individual and that the latter is expected to work for the group. Their aims and goals are more or less similar if not identical. The decline or rather the loss of some of the elements making for familism and the appearance of individualism weakens family stability. Living together they made decisions favouring the welfare of the group; in this case they may be inclined to keep in view only their own individual interests.

Another problem related to the above is the impersonal and anonymous nature of urban living. Families live in close proximity for years together without knowing one another. Even if they do have a nodding acquaintanceship, they are far removed from close and personal relationships. The situation is aggravated by a greater degree of residential mobility found in cities. People move from place to place without finding their feet deep down in the soil. They drift here and there without a sense of belongingness to the place or the people. In the rural community, they exercised their rights, duties and privileges because they were known to most of the people. In the urban community they are lost in impersonality and anonymity. Feeling frustrated in their existing position they try to gain recognition with the help of symbolic factors like clothes and other material possessions. They want others to place them and react accordingly.

Another aspect of the above problem is that migration from rural to urban areas is an individual or at best a family enterprise. Migrants come to the city as individuals or families not as class, tribes or nations. It is not an organized group movement in which they may carry their culture with them. Migrants can neither bring their culture with them nor participate in an unfamiliar culture when they come to the city. They have to give up much that

is familiar and adjust themselves to a different set of social definitions. They struggle between the two—the old and the new cultures—never quite willing to break with their past and their traditions, nor quite accepted in the new society in which they now claim membership. The heterogeneity of city culture is such that the migrants are forced to play a number of conflicting roles. They may be victimized by the clashing heritages of the several groups in which they seek to find a place. It is for this reason that personal and social disorganization sets in.

The trouble with migrants is that they are, initially, ignorant of their own status, because their differences with the other groups have not been specifically defined for them. Nor do they possess enough insight to understand the extent of their differences from other persons in the new environment. When they come to learn of this strangeness, they try to redefine themselves in the new situation. If they make a successful redefinition, they may gradually gain their status. If they remain unsuccessful they may be permanently disorganized and may, as a result, fail to live up to the moral demands of the community. They may, in that case resort to finding an outlet in violation of norms and commission of crimes.

Crimes are, in actuality, an expression of negative mores, they are of the existing moral values of the group. Many studies of the community and crime have analyzed the community in which the criminal was reared. These studies have proved that slum areas with their deteriorated and crowded homes are considered to be breeding place for criminality. Such areas have relatively few effective means of social control over their members. Law breaking is common among them. They are stimulated to obtain by illegal means the material goods which are otherwise denied to them. Slums thus become centres of illicit activities such as prostitution, narcotic trade and other crimes.

The growing incidence of crime in cities is due to the fact that urbaniztion places a great emphasis upon material well-being and disparity in income and purchasing power probably creates more envy between the different classes of society in the city than in village. Those living in cityslums often live only at a short distance from wealthy neighbourhoods. That is why a much greater proportion of the convicted criminals come from the slums than from other urban areas.

A brief reference may also be made to economic disorganization as a social problem of urbanization. The process of urbanization involves a readjustment of economic relationship, a search for a new way to make a living. Being mostly farmers by background, the majority of migrants know only farming as a profession. In cities they find work in industry and small

business. This new way of life lacks security, and unemployment is a constant threat. In the village they knew where to live and what to do. Their chance of acquiring wealth was slight, but they were always assured of food, shelter and employment. The work they have to do in cities is markedly different from what they did previously. They have perforce become industrial workers or petty businessmen. Some of them may be working in the offices. No matter how conscientiously they work, they might lose their jobs at the whim of a foreman, the turn of the business cycle or the caprice of a supervisor. An allied problem is that of increased unemployment in urban areas. In spite of considerable development of industries and services in the country during the last two decades, it has not been possible to absorb a large proportion of rural manpower in the towns. Any increase in urban employment opportunities shows an ever-increasing number of unskilled migrants, who, once in town, are reluctant to return to their villages. Moreover those who move to the town to continue their education tend also to stay there because they cannot find an outlet in the rural areas for their newly acquired knowledge and interests. Thus, in addition to the problems directly related to rapid urban growth, there are those which arise from the aspirations of the citizens for a better life. Ruralites believe that the things valued most in our society—wealth, material possessions, comforts, power and success—are to be found in the city alone.

Another aspect of this problem is that when the villager comes to the city in search of work, he may leave his family behind. He has to send the major portion of his earnings home and make both ends meet in the meagre amount left with him. Thus he becomes more of a liability than an asset to the city.

Another offshoot of the above mentioned phenomenon is that, despite good intentions, many migrants never go home or send for their families. Even when they ask the family to join them in the city, the family members may not, for one reason or the other, be prevailed upon to leave the countryside. The result is a break in the close intimate familial ties which may end up in complete disruption of conjugal happiness. Moral waywardness may follow as a consequence of the above situation. Migrants may seek satisfaction of their animal urges through illegitimate means, thus encouraging immorality, illegitimacy and prostitution. At times adultery may be committed by both the estranged spouses; thus increasing the incidence of extra-marital relations as well as the number of illegitimate children.

Last but not least, it would be pertinent to make a mention of the impact of urbanization upon religion. The breakdown in group relationships suffered by the migrant extends into his institutional affiliations. Religious affiliations are more effective when religion is a community institution. In the simple rural environment, religion and the rest of the social structure

are inextricably interrelated. When primary contacts are replaced by secondary ones and the intimacy of the small village is replaced by the complex structure of the city, religious ties are likely to be weakened. Religion often loses its hold upon the immigrant in his new environment. Heterogeneity of population as well as the presence of divergent religious practices, beliefs and attitudes leaves an imprint on religious organization. Adaptation to a changing environment is a more serious problem in the cities than in villages.

Religion also plays a double role in the adjustment of the migrants. It acts both as an integrating and as a disorganizing force. It holds the migrant group together and provides a powerful emotional and institutional buffer against the shocks of the new life. Simultaneously, religious differences confuse the basis for mutual tolerance and thus may unwittingly hinder the process of adjustment. Religious affiliations may act as a deterrent to assimilation. Religion, thus, plays an ambivalent role in the process of urbanization.

Conclusions and Suggestions

From the preceding discussion it follows that Pakistan, in spite of being a predominantly agricultural country, is experiencing a strong trend towards urbanization owing to the attractions of city life for the rural inhabitants, in addition to the economic and industrial growth which has increased employment opportunities in the cities and consequently has encouraged rural people to migrate to them in search of employment. These migrants add considerably to the already existing problems of the cities. The migrants tend, or are forced by circumstances, to live either in already over-crowded old buildings, or else in various types of temporary dwellings which usually lack the most elementary amenities of life.

A study of the genesis and development of the process of social disorganization and the resultant social effects connected with social problems indicates that these originate, in most cases, from such areas as mentioned above. Major factors causing the growth of social problems there may be recounted as dislocation caused by migration to cities, changing values, violation of prevailing social norms, disorganized economic life, disproportionate sex ratio and breakdown in community and institutional controls.

Social problems that arise from these pathological conditions take the form of crime, drug addiction, family breakdowns, illegitimacy, prostitution, juvenile delinquency and unemployment. Fears, anxieties, conflicts and tensions are at work. Urban living, with its heavy demands on the individual intensifies these.

During periods of social change, crises and revolutions experienced by the whole population, the disorganization process is accelerated and more

manifestations of mal-adjustment are revealed. These symptoms are regarded as problems when the actions go counter to the basic moral and value systems of the society. Society believes it has provided sufficient controls and incentives to make it possible for all persons to adjust. When disorganization increases there is an awareness that specific areas of needs are unmet. Herein arises the needs for improvement of prevailing situation and the importance of urban planning.

Urban planning is a phase of community organization, directed towards some specific purposes and goals. Planning is predicted on the assumption that one's past experience gives one the insight and foresight to prevent various aspects of dis-integration ending in social problems by taking deliberate action.

As cities grow in area and population, their spatial arrangements and patterns are determined, especially in our country, more by haphazard circumstance, than by orderly design. Urban planning is a social process involving a series of progressive steps to redevelop deteriorated sections of the city, build new communities according to established policies or goals or provide plans for future expansion. Urban planning should, therefore, be a part of national policy, and uniform laws and parctices should be enforced. Our growing population is not yet able to cope with the magnitude of its needs. The poverty of the average urbanite and his pre-occupation with obtaining the scarce daily necessities of life are of more immediate concern to him. The common man does not yet understand the concept of planning. Urban planning necessitates an overhaul of the total social and physical environment. Therefore the outlay of capital for improving urban conditions must come from a central source. Provincial governments should be encouraged to cooperate with their respective local agencies and authorities in undertaking city planning. Unless the various levels are coordinated, the central government will find its task insurmountable. Municipal and other local authorities should be encouraged to take the initial steps in dealing with urban problems and they should be provided with financial and technical assistance. Moreover, legal measure should be taken to implement planning schemes and to effect coordination between various governmental levels.

Since effective planning results from consensus among citizens—professionals, laymen and municipal official—it is a social and collective process. People should, therefore, be made to realise their responsibilities as inhabitants of urban areas. Imperative measures should be adopted for conducting intensive training courses in civics for all citizens through educational institutions. Example and precept should be set by community leaders and workers. Audio-visual aids, like cinema and posters, should be made use of.

In order to go deeper into the complex nature of the problem a bureau of municipal research, staffed with competent non-political personnel, should be made an integral part of the city government. The activity of such a bureau would be directed towards seeking solutions of specific problems facing the city. This could be done by conducting research based on actual observation and investigation into the causes of migration, the means of utilizing available resources and the actual needs and desires of the citizens. On the basis of such research it would determine priorities for action at each level of administration. It would help in the establishment of long term comprehensive plans and programmes within the framework of national and regional development plans.

Care should be taken to provide opportunities of work in the rural areas so that rural people are not forced to migrate to cities. Energetic efforts should be made to improve agriculture. Industries should be provided in the villages in order to check the shift of rural population to urban areas. This would also lead to the growth of new industrial cities.

Greater check on inter-city migration should be enforced so as to decrease the incidence of personal frustrations and perhaps disorganization among people. This may be accomplished by cities collecting reliable data on their job opportunities, so that the inexperienced, un-employed or seasonal workers can be guided to job opportunities. Villagers sometimes travel great distances on rumours of work opportunities in the city. Being stranded, they become liabilities to the city.

Organized effort should be made to safeguard, cherish and preserve the old values of the migrants so that they should not suffer emotional disequilibrium on account of conflicting ideas and ideologies in the city. Their attitude can, however, be moulded through the full use of religious teachings. Religion not only acts as a binding force but also serves as an effective form of social control. In order to avoid dissatisfaction and discontentment, they should be safeguarded against illiteracy, illness, disability, unemployment and other similar problems. A wider provision of institutions like schools, playgrounds, hospitals, unemployment insurance and adequate housing provision would go a long way towards the maintenance of their emotional and ideational equilibrium.

Efforts should also be made to provide better methods and agencies for the protection of citizens. They are generally dissatisfied with inadequate personnel and ineffective public services. Law breakers should get the penalty they deserve; municipal care and treatment should be widely facilitated. Police departments should undertake more training programmes and prepare new personnel for countering anti-social elements and rendering

service to the public. Domestic relations courts should have social workers and counsellors in addition to judges specialized in family and child welfare. Experienced social case workers and probation officers should deal with cases of delinquency. Systems of probation and parole should be more widely introduced, and correction and mental institutions should be improved.

Last but not least, psychologists, sociologists and social workers should be associated with agencies dealing with social and personal problems, such as penal and crime courts, housing and city planning agencies, research workers and policy makers. This would not only help in better prediction of the outcome of social situations, but would also reduce, if not eliminate, social problems.

Population Trends and Urbanization in East Pakistan

H. A. ZAMAN

From times immemorial when man started producing surplus food pre-industrial civilisation developed and the non-agricultural specialists settled in selected favoured places termed cities. These cities or urban centres were located on the major transportation routes. First these urban centres were controlled by the theocrats and the priests and then the feudal lords with their fighting legions who retained a class of specialist artisans—masons, carpenters, weavers, potters, etc. and the servants around them. Diverse non-agricultural economic activities were concentrated in and diffused from those urban centres. During the mercantile age, new ideas and inventions started flowing into them along with the expansion of trade and commerce, and along with the ruling dynasties, the merchant class started controlling the urban centres. The mercantile age continued upto the beginning of later part of 18th Century when the Industrial Revolution started in Western Europe.

During the 18th and 19th Centuries a series of inventions and discoveries in the fields of the use of inanimate energy, technology for mass production, quick and efficient transportation and communication system, etc. ushered in the modern industrial age. Rapid technological changes and development of industries during the last two hundred years led to the emergence of new urban areas which became the centres of big industrial concentrations and growing trade and commerce. Manifestations of modern urbanisation is best seen in the countries of North America, Europe and in Australia where at present proportion of urban dwellers are as much as 70 percent of the total population. In Asia the tempo of modern urbanisation came late and still later it came to East Pakistan.

Historically, the land of East Pakistan remained purely an agricultural one even in the 18th Century. During the Mughal period Dacca was the only centre which attracted some urban population. Most of them belonged to the Mughal Army, the artisan and service population retained by the rulers around them. Chittagong at that time was a small port and trade centre which used to be visited by the Arab, Portuguese and English Traders. During the latter part of the 18th Century when the British rule was established in Bengal, the centre of attraction of trade, commerce, industry and

administration started shifting from Dacca to Calcutta. The once flourishing cottage industry which reached its zenith during the Mughal period gradually declined with the establishment of cotton and textile industries in Great Britain and also in Indo-Pak Sub-continent. Calcutta was the main commercial centre and the region now comprising East Pakistan turned into an agricultural raw material supply base for Calcutta. During British period the seat of administration of each of the administrative regions developed into urban centre where professional traders settled and educational institutions grew up. Inspite of satisfactory communication facilities large scale urbanisation could not take place due to the absence of Industrialisation.

After independence in 1947, Dacca as the capital of East Pakistan, attained great importance. A few other urban areas of the province were also coming into prominence.

But before getting into these points, I would like to explain that I will refer to urbanisation in a quantitative term as the proportion of total population living in urban centres whereas by urban growth I would refer to the rate of increase of urban population from a certain base year, though historically, urbanisation and growth of towns and cities have occurred together and the pace of urban growth has always been considered as a measure for total urbanisation.

At the turn of the present Century the population of the area what is now East Pakistan was 28.9 millions as revealed by the census of 1901 and the population of East Pakistan was 50.8 millions in 1961: an increase of 78.7% in 60 years. It is important to mention here that though some of the decennial census figures from 1901 to 1941 are to be taken with some reservation but as background data one has to refer to these figures. The growth of population and decennial variation from 1901—1961 shows that the rate of increase has been highest during the last decade.

East Pakistan happens to be a predominantly rural area. The extent of urbanisation was negligible until the last two decades when there had been indication towards a steady though rather slow, process of growth. At the turn of the present century a mere 2.4% of the total population lived in urban areas. This position remained almost static till 1921. Some substantial increase in urban population was noticeable in 1941.

In 1951 urban population was 4.3% and in 1961 the urban population was 5.3% of the total though in absolute number the total urban population increased from 18.2 lakhs in 1951 to 26.4 lakhs in 1961 roughly 50% in growth. For further details, one may have a look into the Table 1 which deals with the district-wise distribution of urban and rural population.

Analysing Table 1 we come across a picture which is far from uniform. The variation is wide from 1.4% urban population of Noakhali to 14.8% of Dacca. The position of Chittagong district with more than 12% of urban population is only second to Dacca. In the size of its urban population, Khulna comes third with 7%. The urban population of two other districts are just above the provincial average while the urban population of the 11 remaining districts is below the provincial level. The percentage in three districts declined during the decade.

The relative growth of urban and rural population compared to the overall growth of the province's population has been presented in Table 2. "The rates of increase in the urban areas have always been higher than in rural areas".[1]

"An analysis of the situation in Pakistan would show that the rate of urbanization in West Pakistan is faster as compared to that of East Pakistan. In terms of percentage 86.9% of population of Pakistan lived in rural areas and 13.1% in urban areas. In East Pakistan 94.80% lived in rural areas and 5.3% in urban areas. Comparative figures for West Pakistan were 77.5% in rural areas and 22.5% in urban areas. Thus out of the total urban population of Pakistan only 21.5% lived in East Pakistan and remaining 78.5% in West Pakistan".[2]

For the purpose of discussion of the growth of population and urban agglomeration—the urban centres in East Pakistan can be classified as under:

	Population
Cities	1,00,000 and above.
Towns	50,000 to 1,00,000 25,000 to 50,000 5,000 to 25,000

"There were 64 towns of urban units when the 1951 census was taken. The number has increased to 78 in 1961. The urban population in 1951 was 18 lakhs and this increased to 26.4 lakhs in 1961 indicating a trend towards a steady, though rather slow process of urbanization in East Pakisan".[3]

According to the basis of classification as mentioned above, only two urban areas were treated as cities in 1951 census. There were four under this class according to the census of 1961.

[1] *Census of Pakistan*, Vol. 2, East Pakistan Population 1961 p. II. 22.

[2] *Ibid.*, p. II. 16-18.

[3] *Census of Pakistan*, Vol. 2 : East Pakistan Population 1961 p. II. 16-18.

Khulna and Narayanganj are the two urban areas which have gained the status of cities in 1961 due to the large concentration of new industrial units around them.

All the towns between 25,000 and 1,00,000 population group in 1961 census showed increase in the number of population since 1901. 11 towns (namely Rajshahi, Mymensingh, Comilla, Jessore, Pabna, Rangpur, Sylhet, Dinajpur, Bogra, Faridpur and Barisal) out of this group, were district headquarters; 6 were sub-divisional headquarters and the remaining one Bhairab was an important railway junction business centre and as inland river port.

The growth of towns under 25,000 population between 1901 to 1961 has been fluctuating. Generally speaking towns in and around which industries are developing, usually show an increase in population and those towns which have no industrial impact and especially the one situated near the border, are declining in size of population.

"Out of the total urban population more than 45% lived in the four cities. Next to big cities it is the middle sized towns that claim the largest proportion of town dwellers. The comparatively smaller towns with population below 25,000 claim about 26% of urban population."[4]

An analysis of Table 1 shows that the rate of increase in most of the urban areas is in keeping with the general trend towards urbanization of the province. But a few urban areas are growing faster than others.

FACTORS OF URBANISATION

Looking into the factors which are causing urbanisation in East Pakistan, the first point that strikes our mind is the influx of refugees after independence in 1949. After independence almost all the urban areas of East Pakistan were affected due to the emigration of Hindu merchants, traders, etc. The vacuum thus created in the population of East Pakistan was filled up to a great extent by the Muslim immigrants from India. These immigrants were mostly settled in different towns of East Pakistan among which Dacca and Chittagong absorbed the largest number. As a result, 1951 census of East Pakistan showed sharp upward trend of population in a few towns and cities.

"The refugees who have entered East Pakistan through authorised routes migrating from neighbouring provinces of West Bengal, Assam, Tripura State and Bihar (India) came in two phases, total 15 lakhs up to Sept. 1965."[5]

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[4] *Census of Pakistan*, Vol. 2 : East Pakistan Population 1961 p. II. 19.

[5] Mr. M. A. Zaman—*Problems of shelterless People in East Pakistan.*

A great many of these refugees, concentrated in the urban areas of East Pakistan, took up different professions for livelihood. Many towns became over congested and the need arose for their rehabilitation. The Government took up different schemes for housing and other necessary amenities which led to certain development of the towns.

The next factor, the most important one, causing urbanisation in East Pakistan is industrialisation. Beginning with the First Five-Year Plan, a sustained effort for all-round development of the province's economy has been made. With the successful implementation of the Second Five-Year Plan, trippling the industrial investment, urbanization gained a tremendous fillip which is further promised to be accelerated with the programmed investment in industry during the Third Five-Year Plan. In anticipation of a successful implementation of the Third Five-Year Plan, it is estimated that a dramatic change in rate of urbanization will be revealed by 1971 census as compared to the previous decade.

This commitment of the government to the industrial development of the province, automatically commits to a process of urbanization and urban growth. This growth may be concentrated in a few cities (such as Dacca-Narayanganj, Khulna and Chittagong) or distributed over a considerable number of towns, such as Narshingdi-Ghorasal-Demra, Kushtia, Sylhet, Dinajpur, etc. Along with rural agricultural economy some urban type of economy is gradually emerging.

With such trends in industrialization, urbanization and development of communication system and a tendency of population mobility from the rural places to the urban ones is becoming identifiable.

According to a U.N. estimate a sizeable (25 to 30%) agricultural labour force is underemployed. This constitutes a push factor which coupled with the attraction of cities and towns with better social facilities and amenities of the cities termed as the pull factor, have created a favourable condition for urbanization.

The development and improvement of communication system—(railways, waterways & roads) indirectly contribute to urbanization by increasing the mobility.

It appears of course, that industrialization in East Pakistan is generally demanding for the development and expansion of a number of urban centres around the existing industrial zones. To give an idea about the areas that can be developed as future urban centres in the province, it may be referred here that apart from three main industrial zones in the province, namely,

Tongi-Dacca-Narayanganj, greater Chittagong and Khulna-Daulatpur, there is a possibility of developing a few other secondary industrial centres in Brahmanbaria, Bhairab Bazar, Ghorasal-Kaliganj, Narshingdi, Bogra and Sylhet. In fact few of them namely: Bhairab Bazar, Bogra and Brahmanbaria have become potential industrial base due to the availability of power and raw materials. In addition, the creation of new urban centres in Ghorasal, Demra, Chandpur, for example, is being necessitated.

Coming to the problem of urbanization, this can be termed as a problem of inadequate finance and lack of proper technical and organisational means. If we would have had enough resources the economic base of our urban centres could have been expanded to absorb the incoming population. Simultaneously, we could have created congenial living conditions whereby the social problem generated through breaking up of traditional family system could have been avoided or in other words 'human problems could be minimised.'

A look into the prospects of urbanization will indicate volume of human movement towards our urban areas in the coming future and we should be ready to estimate quantitatively, the magnitude of all important basic amenities and the required volume of human and capital investment for adequate urban development.

According to an estimate by Mr. J. C. Eddison "Urban population in East Pakistan will increase by 6.4 million by 1970." According to another estimate by Mr. H. Rashid, Deputy Chief, Planning Department, Government of East Pakistan, urban population in East Pakistan will be only 9.5 million by 1985.[6]

In view of the divergence of estimates a realistic assessment of the prospects of urbanization has to be made through systematic research. For this purpose as well as for handling the problem of urban planning and development, the East Pakistan Government has created the Urban Development Directorate and negotiated through the efforts of Planning Commission for a U.N. Special Fund technical assistance programme in this field.

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[6] H. Rashid, "*Some of problems of Urbanization and Urban Growth in East Pakistan.*"

TABLE 1

Rural and Urban Population by Districts as revealed by the Censuses of 1951 and 1961

Locality.	Rural					Urban				
	1961			1951		1961			1951	
	Number (thousand).	P.C. of population.	P.C. Change	Number (thousand).	P.C. of population.	Numer (thousand).	P.C. of Population.	P.C. change	Number (thousand).	P.C. of population.
Rajshahi Division										
1. Dinajpur ...	16,38	95.8	28.2	12,78	94.4	72	4.2	6.0	77	5.6
2. Rangpur ...	36,37	95.8	30.4	27,89	95.6	159	4.2	24.9	128	4.4
3. Bogra	15.27	97.0	23.0	12,14	97.2	47	3.0	29.0	36	2.8
4. Rajshahi ...	26,91	95.7	26.9	21,20	96.2	1,20	4.3	42.1	85	3.8
5. Pabna	18,60	94.9	22.8	15,15	95.6	100	5.1	43.2	69	4.4
Khulna Division										
1. Kushtia	11,03	94.6	30.7	8,44	95.4	63	5.4	56.1	41	4.6
2. Jessore	21,15	96.6	32.1	16,01	97.7	75	3.4	101.3	37	2.3
3. Khulna	22,76	92.9	13.4	20,07	96.7	1,72	7.0	150.0	69	3.3
4. Bakerganj ...	41,42	97.2	18.0	35,10	96.4	1,19	2.8	9.8	132	3.6
Dacca Division										
1. Mymensingh ...	67,78	96.6	21	56,03	96.9	2,40	3.4	32.3	182	3.1
2. Dacca	43,42	85.2	18.6	36,61	89.9	7,54	14.8	83.2	411	10.1
3. Faridpur ...	31,00	97.5	14.1	27,17	97.9	79	2.5	36.3	58	2.1
Chittagong Division										
1. Sylhet	34,19	98.0	14.0	28,98	98.0	71	2.0	16.1	61	2.0
2. Comilla	42,50	96.8	15.6	36,76	96.9	1,39	3.2	19.2	117	3.2
3. Noakhali ...	23,49	98.6	14.5	20,50	99.0	34	1.4	58.6	22	1.0
4. Chittagong ..	26,10	87.5	17.7	22,16	88.3	3,73	12.5	26.9	296	11.7
5. Ctg. Hill Tracts ..	36,02	94.1	26.1	2,87	100	23	5.9	100	..	..

Source:— Census of Pakistan, Volume-2, East Pakistan Population—1961.

TABLE 2

Increase of Rural and Urban 1901—1961 East Pakistan

Decades	Numerical increase (000's)			Percentage increase		
	Total	Rural	Urban	Total	Rural	Urban
1901—1911	26.27	25.22	1.05	9.08	8.94	14.96
1911—1921	16.99	16.28	.71	5.38	5.29	8.80
1921—1931	23.50	21.52	1.98	7.07	6.65	22.55
1931—1941	63.93	59.32	4.61	17.96	17.18	42.84
1941—1951	—.65	—3.48	2.83	0.15	—0.86	18.41
1951—1961[1]	89-08	80-87	8.21	21.24	20.16	45.11

(1) Figures for 1951 and 1961 exclude non-Pakistanis.

Sources:—Census of Pakistan, Volume-2. East Pakistan, P. II-22.

Problems of Urbanization in Dacca

Moinuddin Choudhury

Introductory Remarks

As with many other cities in Pakistan, urbanization was accelerated in Dacca after independence. Urban characteristics have become sharpened during the last 19 years and the urban area has developed by leaps and bounds, devouring the adjoining rural chunks and having sprawled well past the municipal boundaries. The population has increased at a fantastic rate and there has become a flurry of commercial, industrial, cultural and administrative activities.

The functional pattern of Dacca has undergone a radical change under the stress of urbanization. The city has long outgrown its mere educational and small trading importance and has fast manifested industrial and commercial sinews. This has unleashed concomitant problems like those of transport, scramble for land, and increased demand on civic amenities.

Before 1947 the northern boundary of urban Dacca was practically circumscribed by the railway on the north (except for a few projections towards Dilkusha and Purana Paltan), the Iron-Bridge to the east, and Lalbagh on the West. In the south there was the natural boundary of the river Burhiganga. The municipal area was a bare 7.8 square miles.

Thinking on the replanning of the city began as early as February, 1948 when, under the guidance of a Special Committee, Mr. Coleman Hicks, an experienced architect, was appointed as adviser. Azimpur and Bailey Road Government residential blocks, New Market, Jinnah Avenue, Rajarbagh Police Lines and Posts and Telegraph Colony were planned and built.

The municipal area expanded to become 21 square miles when 42 new areas were added to it in 1961. Among the new localities added to the municipal area were Dhanmandi, Maghbazar, Naya Paltan, Kamalapur, Shahjahanpur, Karwan Bazar, Siddeswari and Motijheel P & T Colony. This expansion also added 2.50 lakh persons to the municipality's population of 3.26 lakhs, making a total of 5.76 lakhs. The municipal limits were further defined in March, 1962 when three areas (Goran, Ramchanderpur,

Enayetganj) were added by notification. The Dacca Municipality has now an area of 29.9 square miles and the population of the municipal area has been roughly put at 11 lakhs, besides about a lakh of floating population.

While looking at the recent expansion of Dacca's urban area, note should be taken of a relevant element in the geographical environs of the city. Dacca is hemmed in by a main river on the south, and on the east and west is restricted by wide tracts of low-lying land, which is flooded up to a depth of eight feet during the peak rainy season (June to September). Expansion is possible only towards the north, and the future Dacca will, consequently, take more and more on the shape of an elongated belt with the old town as its broad base and its apex two northwards prongs, the one following the railway to Tungi (broken by the extensive area of Dacca Cantonment) and the other taking a more westerly direction to Mirpur. Besides these, some select pockets can always be reclaimed to fulfil the ever-increasing need for buildable land and thereby to satisfy the demands of urbanization.

The urban characteristics have maintained their sprawling in the natural spatial direction of the city's growth. Mohammadpur and Mirpur have been followed by Gulshan and Benani. The Second Capital is fast coming up and Baridhara and North Satellite Town are in the making. In the east, Jatrabari has been included in the municipal area, and in the south feasibility study is once again underway for reclaiming and developing Keraniganj to the south of the river Burhiganga and to construct a bridge over the river.

The problems of urbanization are complex and manifold. The scope of this paper is confined to some select ones. Specifically, these are accommodation, open spaces, segregation of residential zones and industries, sustaining cohesion of community life, roads, and facilities for marketing of commodities and shopping.

Before discussing these problems, it may profitably be noted that in the newly developed urban areas these problems are fairly easy to tackle, for the areas are starting from a clean slate and, as such, there is wide latitude for planning and implementation. The real problem is posed by the never changing old town where the pattern is essentially medieval and hardly admits of any planned development except through a wholesale demolition which is not deemed feasible. As the entire Old Town falls within the Dacca Municipal area, the lion's share of the brunt for their development, in so far as there is scope for any, falls on Dacca Municipality. It should also be obvious that any planned project in Old Town is possible only in a very limited, piecemeal fashion, as, unlike the new areas, large tracts are not available here for development.

ACCOMMODATION

Among the most pressing problems, generated by the quick pace of urbanization in Dacca is that of accommodation. The problem has assumed tremendous proportions owing to the terrific swell in the city's population caused partly by the setting up of commercial and administrative offices, partly by immigration from India and from other parts of the province itself, and partly by natural growth.

There developed a tremendous demand on space and underlined the need for housing and other allied amenities. According to a rough estimate, there is a backlog of about 40,000 dwelling units in Greater Dacca. Almost half the population of Greater Dacca lives in Old Town where dwelling pattern is characterised by acute congestion and dwelling units are far from having the minimum requirement of adequate ventilation and sanitation.

Hundreds of residential plots have been allotted in the newly developed areas, but the demand has hardly receded. An ambitious 20-year project has of late been taken up by the Dacca Improvement Trust for the development of a North Satellite Town six miles from the northern fringe of the city. To be developed at an expenditure of Rs. 25.30 crores over a gross area of 3,450 acres, the Town has an ambitious target of carving out and offering 36,000 residential plots. It is, incidentally, the biggest residential scheme undertaken in the country.

PARKS AND OPEN SPACES

Parks have been metaphorically called the lungs of a modern city with its hectic pace and crammed pattern of life. Urbanization in Dacca has resulted in congestion and lack of open space for recreation and fresh air.

The need for parks and open space shows up most acutely in the Old Town. According to the Master Plan of Dacca, there were in 1961 only 19 acres of parks in Old Town with a population of 3,00,000. This means a meagre 0.06 acre per 1,000 persons. The average acreage of open space for the whole of the city was put at 0.05 per 1,000 persons. The Master Plan proposed the reservation of 4 acres of land per 1,000 persons for parks and play grounds in the newly developed areas.

In the new urban areas the developing of parks was not much of a problem as large tracts were available. At the outlying model town of Gulshan, big parks have been developed. A children's park is fast coming up on the site of the former Government House premises.

The real problem in this context was posed by the conditions obtaining in the Old Town where there are poor opportunities for developing recreation spots, although it is there that open space is most needed. Dacca Municipality has developed two parks in Nawabganj and Hazaribagh Unions. A Children's Corner has also been carved out by the Municipality at Jagannath Shaha Road and Alauddin Road. Armanitola Park has been retouched and renovated and the renovation of Sirajuddowla Park will be taken up next. The Municipality is developing more parks in the old area. Very little effort was made in the past to cater for the needs of younger generation, particularly in sports. The municipality has recently developed four football grounds and started construction of two covered gymnasia at Pakistan Maidan and Rahmatganj.

Sustaining Community Cohesion

An inevitable outcome of urbanization the world over has been the weakening of community life, and the development of what Aldous Huxley called the trend to " atomism " (that is, individuals in a community live like lifeless atoms of an object which, though incapable of an independent existence, are, all the same, quite indifferent to each other). This trend has been considered by sociologists as the harbinger of many socially undesirable trends and in all highly urbanized communities intensive efforts are being made to provide greater opportunities of close social contact.

Community Centres have apparently been conceived of as one of the effective means to bring together the people of a locality, more especially the youths, and thereby promote understanding and sustain the fabric of community life. Governor Abdul Monem Khan some time back announced the Government's decision to equip each one of the 30 Unions under Dacca Municipality with a community centre under the works programme. A grant of Rs. 15 lakhs has been sanctioned by the Government for the purpose.

Already Community Centres attached with municipal parks have been built at Hazaribagh, Nawabganj, Sharafatganj, Katra, Lalbagh and Rukonpur Unions, and more are coming up at Chawk Bazar and Azimpur Unions.

Segregation of Residential Zones and Industries

Among the major problems that urbanization has brought in its wake is that of the segregation of industries from residential areas. In a wider perspective this involves the issue of proper land use.

It is an accepted axiom of modern town planning that industrial installations with their workshops emitting smoke and noise and entailing a rush of heavy traffic should be located outside the periphery of a residential zone. This is deemed desirable from the standpoint of public health and for ensuring an atmosphere of relative calm in a residential locality. The need for segregation of industries has also been felt for the smooth running of the industrial installations themselves, unfettered by the obstacles faced and risks involved in a residential zone.

All the same, the industries should be preferably located in the vicinity of the city so as to get the maximum benefit accruing from such proximity. Here again, it is in Old Town at that the problem seems most difficult to tackle. In the newly developed urban areas on the outskirts of the city, industrial areas have been developed or are being developed. Tejgaon Industrial Area in the new city was the first to be developed in a planned way, and an Industrial Estate is being developed at Tungi outside Municipal limits. An Industrial area has been projected at Postgola for medium industries.

In the Moghal days, it may be recalled, there existed whole localities of artisans which were named after their trade, *e.g.*, Sankhari Bazar, Kumartuly and Tanti Bazar. The workshop and houses were on the same premises and have continued to this day. In modern times, however, the industries are different: large in scale, noisy, and chemicalised, *e.g.*, tannery or metal works. These industries must be located outside the residential areas.

According to the bye-laws of Dacca Municipality the location of medium or heavy industry in residential localities is not permissible. But owing to the peculiar expansion of the city and commercial activity during the last 19 years, these elements have found their way into residential areas.

Transport

The expansion of the city in the post-independence period brought increased traffic in and around Dacca. Transport has come to be a problem. There is a need for wider and better roads, larger number of public transports, and traffic control.

In the new town and newly developed urban area, it is possible to lay roads in a planned way and visualise the needs of the future. But in Old Town the situation is different. The narrow and tortuous roads of Old Town were hardly intended by modern standards for any very sizable volume of machine propelled vehicles. The result has of late been traffic bottlenecks and accident risks.

The two main roads in Old Town are Nawabpur Road running north-south from the railway crossing to Sadarghat and the road running east-west from Iron Bridge to Lalbagh (the "Main Bazar Street", as this roadway is called in old Municipal records of the nineteenth century). Nawabpur Road and Islampur Road are even today the most busy and congested thoroughfares. The Principal north-south road link between the Old Town and the new, Nawabpur Road has by now become overworked and has proved utterly incapable of coping with the volume of traffic on it. And even when the railway crossing is removed, this narrow road without any footpath cannot conceivably meet the demands of the traffic.

Both Nawabpur Road and Islampur Road were repaired by the Dacca Municipality in 1964-65 and this has contributed to making the flow of traffic somewhat easy on these roads. However, no satisfactory results can be had unless the road is widened. This will entail wholesale demolition of the rows of structures on both sides of the road and will dislocate business worth crores of rupees. The alternative preferred by planners is laying of an alternative north-south road from the present railway to the river, running parallel to the Nawabpur Road about 100 yards to the west. This projected north-south road to be laid by Dacca Improvement Trust will pass through the heart of residential area and will need demolition of many structures. However, it will also pass through many slummy tracts and " khals " which will be automatically filled up thereby. The road will also project northwards beyond the railway and already about half a mile has been built in this direction.

The Municipality has also built a road from Peelkhana to Rayer Bazar where a Municipal Market is in an advanced stage of construction. Another municipal market, incidentally, has been built at Sutrapur. Development of market at Nawabganj and Tejgaon also will be taken up by the Municipality soon.

In the new urban areas a number of roads have been made by the respective authorities.

There is shortage of public transport vehicles and traffic personnel in Dacca. It is suggested that more and more auto-rickshaws and baby taxis be put on the roads, and that the number of pedal rickshaws be minimised under a phased programme. This will, however, require first the improvement of roads, especially in the Old Town.

FINANCE

Budget of Dacca Municipality is Rs. 17.6 millions. The amount collected is hardly enough to provide required civic needs to the people living within

the Municipal limits. Government is alive to its problems and limitations. It is equally anxious to develop it in planned manner, and have set up organizations like Dacca Improvement Trust for orderly development by planning and zoning and variety of its services, and the Water and Sewerage Authority for water supply and establishment of sewerage in the city. The WASA has prepared a comprehensive scheme which is likely to be implemented soon.

People in this part of the country are very conscious of their rights and privileges. Since the Municipality is responsive to the general welfare, citizen's participation is forthcoming and such participation is essential for implementation of development programme. In spite of the present difficulties stated above, I foresee a bright future of the historic city of Dacca.

Population Growth and Problems of Islamabad and Rawalpindi

MISS FARHAT HUSSAIN (DR.)

I. INTRODUCTION

Pakistan, which has the remains of 4,500 years old cities, is basically an agricultural country and the total urban population figure remains low as seen from the following table :

TABLE 1

Percentage of Urban Population

Year	Percentage Urban
1901	5.1
1911	4.9
1921	5.4
1931	6.5
1941	7.9
1951	10.4
1961	13.1

Source : Population Census of Pakistan, 1961, *Census Bulletion No.* 2-p. 14.

Rawalpindi, the eighth largest city of Pakistan, (according to the Census of 1961) was founded in the middle of the 19th century. Although its population is growing at a rapid rate, strictly speaking it is not fully urbanized because it still exhibits many rural characteristics.

II. POPULATION OF RAWALPINDI 1868 TO 1941

Ancient Greek and other coins and broken bricks found over two square miles area around the existing General Post Office's site in Rawalpindi indicate the existence of an ancient city here. The present city, however, was restored by the Gakhars after 995 A.D. It could not prosper because of being

exposed to successive invasions. After 1765 the town as the trading centre of the area began to grow at a rapid rate.[1]

The twin city system introduced by the British led to the establishment of the Rawalpindi Cantonment in 1849. As can be seen from Table 2 both the city and the cantonment increased at a rapid rate from 1879 to 1886. This was due to the employment opportunities created by the laying of the railway line and greater recruitment in the army as a result of Kabul War :—

TABLE 2

Population of Rawalpindi

Year	Population	Per cent increase over the preceding figures
1868	28,586	—
1881	52,975	—
1891	78,919	+48.9
1901	87,688	+11.1
1911	86,483	— 1.3
1921	1,01,142	+16.9
1931	1,19,284	+17.6
1941	1,85,042	+55.1
1951	2,36,877	+28.0
1961	3,40,175	+43.6

Source : Gazetter of Rawalpindi Distt: 183-84 (p. 122) Punjab Distt: Gazetter Rawalpindi Distt: 1907 (p. 50) Distt: Census Report, Rawalpindi 1961 (IV-6). Census Bulletin No. 2, p. 18.

In 1881 there was a severe drought with no rain from September until the end of February the following year. From 1902 to 1911 there were series of lean years reaching almost famine conditions which had serious repurcussions on the rural population and in turn affected the trading community of Rawalpindi. Some of the traders migrated to other areas. This is the reason why the population figures recorded for 1911 showed a decrease (Table 2).

The World War I was probably responsible for the increase in population for the year 1921. This increase was insignificant as compared to the one reflected by the figures of 1941, which again was probably caused by another war that is World War II.

[1] Punjab District Gazetters Vol. XXVII A. Rawalpindi District, with Maps-1907. *The Civil and Military Gazettee*, Lahore-1909

During this period Rawalpindi served as the market town for the neighbouring areas and also as one of the important cantonments for the defence of the area.

III. Population of Rawalpindi—1947 to 1959

Immigration was the greatest single factor contributing to the growth of Rawalpindi population during this period. About 43,029 families or approximately 2,15,145 persons came to Rawalpindi. The largest group belonged to India and the second largest to other parts of West Pakistan.

TABLE 3

Immigration into Rawalpindi Urban Area since Independence

Number of Families

Year of immigration	Total	Place of origin				
		India	Other parts of W. Pak.	Rural areas of Pindi Distt.	Other countries	East Pakistan
1947	19,355	15,926	2,014	878	411	126
1948	3,203	1,112	1,113	786	180	12
1949	1,703	419	742	508	26	8
1950	2,675	354	1,696	601	21	3
1951	791	102	529	139	17	4
1952	1,306	129	636	508	26	7
1953	1,328	53	848	416	5	6
1954	1,874	37	1,272	554	3	8
1955	1,127	21	636	462	4	4
1956	1,194	14	477	693	5	5
1957	2,698	13	1,749	924	3	9
1958	2,039	48	1,325	647	8	11
1959	3,736	50	2,542	1,109	10	25
Total:	43,029	18,278	15,580	8,225	719	228

Source : Nazir Ahmed, *Social-EconomicSurvey*, *Rawalpindi*-1960. Central Statistical Office, Karachi 1960.

Although the Hindus and Sikhs migrated from the Rawalpindi area in 1947; replacement was more than made up with the immigration of Muslims

from India. According to the available data, 15,926 families moved into Rawalpindi (*see* table 3). These persons included government servants, agriculturists, traders, and industrialists. Some carried on their old professions while others changed them according to the jobs that were available.

From 1947 to 1959, 15,580 families settled in Rawalpindi from various parts of West Pakistan. This movement was partly due to the decision of the Government to locate its Headquarters in Rawalpindi and partly to the employment opportunities available in the area.

Only a limited number of persons can be employed in cultivation. Because of better facilities and greater job opportunities available in the cities there is often a movement of population from rural areas to urban areas. For these reasons people from the rural areas of the district have been moving over the years to the city. Immigration was particularly heavy in the years 1947, 1948, 1957 and 1959. The flow of rural population to Rawalpindi urban area during the year 1947-48 could probably be related to the new business and industrial concerns that came up as a result of partition. The greater increase in immigration during the year 1959 seems to be directly related to the shifting to the interim capital from Karachi to Rawalpindi.

In 1959 Rawalpindi was a calm and quiet place. Tongas and buses were the main means of public transport and this was supplemented by a few taxis. Most of the streets had a deserted appearance after sunset. The main shopping centres had one or two storey buildings and life in general was slow. It would be correct to say that this was Rawalpindi's transitional stage between a town and a city.

IV. Growth of Islamabad and Rawalpindi—1960 to 1966

(a) *Islamabad*

In 1959 the Government of Pakistan decided that the permanent capital of the country over Islamabad should be built eight miles north of Rawalpindi and the Government should shift there by the end of 1965.

The preliminary master plan and programme was prepared in October 1960 and the first shifting of the government servants, consisting of 1,009 families, took place in October 1963. The intervening period was utilized in implementing the project in three stages. The *first stage* consisted of carrying out detailed ground surveys and preparing maps, acquiring land, and in getting the site cleared of the original occupants. The *second stage* comprised the planning and laying out of the roads and various services and finalizing the designs of various buildings to be constructed. The *third stage* was marked by actual construction of buildings which started in 1962. During this

year the population of Islamabad consisted largely of the labourers who worked on various construction projects.

TABLE 4

Estimates of Population for Rawalpindi and Islamabad

Year	R'pindi Municipal Committee	R'pindi Cantt. Board	Pockets between R'pindi and Islamabad	Islamabad	Total
1	2	3	4	5	6
1959	1,84,537	1,41,277	—	—	3,25,814
1960	1,89,951	1,42,450	—	—	3,32,401
1961	1,97,370	1,43,602	—	—	3,40,972
1962	2,03,711	1,45,040	1,000	10,000	3,59,751
1963	2,10,230	1,46,530	1,700	22,045	3,80,505
1964	2,16,944	1,48,062	2,000	27,189	3,94,195
1965	2,23,711	1,49,518	25,000	33,193	4,31,422
1966	2,26,825	1,50,244	40,000*	44,555+	4,61,624

Source : Rawalpindi Municipal Committee, Cantonment Board, Capital Development Authority and Ministry .of Works

* June, 1966

\+ December, 1966.

As mentioned earlier, the first movement of government servants took place in 1963. The second and third groups of government employees, consisting of 828 families, shifted to Islamabad in 1964. The fourth group, 677 families, moved in 1965.

The figures for Islamabad given in Table 4 include the Government servants, Capital Development Authority employees, and persons engaged in essential services like telephone and telegraph, education, police, postal authorities, health, banks, Water and Power Development Authority, Sui gas, labourers and private persons.

In November this year the Central Government Ministries, which are scattered in various parts of Rawalpindi will move to Islamabad. Some of the Karachi offices will also be relocated. This will involve shifting of 2,400 families.

(b) *Rawalpindi*

With the decision to shift the interim capital from Karachi to Rawalpindi the city began to grow at an accelerated pace. The growth of population can be seen from the estimates of population given in Table 4.

During 1957 and 1960, 2,702 government servants, consisting of approximately 13,510 persons, settled in Rawalpindi and with them came persons connected with services and industries etc. This influx was largely responsible for the construction of 2,471 houses in the Satellite Town area and 1,700 new houses in the Rawalpindi Cantonment area. This rapid growth had its impact on the commercial centres of Saddar and Raja Bazar where the old structures are being quickly replaced by modern buildings.

So far the C.D.A. has acquired 41,375 acres of land and 9,995 houses for the Islamabad project. Although efforts have been made to settle most of the displaced persons in the colony areas in the Montgomery District, the Multan District and the Guddu Barrage area, most of these families settled in the pockets between Islamabad and Rawalpindi where approximately 4,000 houses have been constructed.

The accelerated pace of population growth is largely responsible for the 'new look' of "saddar area" and the expansion of the city. With the shifting of the capital to Islamabad the pace of development in Rawalpindi might slow down; but it is also possible that the increase in business and industry may cause it to grow at even a faster rate than before.

V. Problems

Following are some of the problems which are directly related to the quick growth of this urban area—

(i) *Roads*

Streets of Rawalpindi were designed for pedestrians and slow moving vehicles like bicycles, bullock-carts and tongas. Gradually trucks, buses and cars were introduced until 1959 there was no serious traffic problem.

The number of slow moving vehicles decreased from 2,836 in 1959 to 2,238 in 1966 but during this period the number of motorised vehicles (cars, buses and trucks etc.) increased from 4,918 in 1960 to 11,380 in 1966.[1] Most of the main roads of Rawalpindi, particularly Murree Road which links the City with Islamabad, have reached saturation points. Apart from the fact that it takes a long time to cover even short distances, the incidences of serious accidents have gone up.

Streets in the newly developed pockets are narrow, winding and at times unpaved and blind. These streets have also created traffic hazards.

(ii) *Sub-Standard Housing*

As the shifting involved thousands of persons within a short period, quick solutions were made to meet the accommodation requirements. The

[1] Data supplid by the Excise and Taxation Officer, Rawalpindi.

arrangements made by the Government were based on some sort of planning, but the building activity carried out by private individuals within the pockets between Islamabad and Rawalpindi were without any plans. In this way thousands of sub-standard houses have been built lacking all or some of the basic amenities like water supply, sewerage, drainage, and electricty. Most of these slums are located around the higher income residential areas.

(iii) *Facilities*

Before 1960, Rawalpindi was only a garrison town and the marketing centre of the region with limited facilities. Even now the city does not have good cinemas, swimming pools, auditorium etc. A beginning has, however, been made and new airconditioned cinemas are being constructed and 'A' type hotel is also under construction.

SOLUTIONS

In order to improve the traffic situation on Murree Road, the local authorities have undertaken the widening of this road. Some of the streets have been converted to allow only one way traffic. These solutions have helped only to a limited extent as there are bottle-necks on the roads caused by the building encroachments and their removal is very costly.

The intersections of the roads are also defective. Proper solution can be found out after making a detailed study of the roads in relation to the volume of traffic, alternative routes available, and location of various functions.

In order to avoid further deterioration of the traffic situation, it is essential to ensure that all future building activity takes place in a properly planned manner.

The Indo-Pak War of 1965 is largely responsible for this area being considered for setting up a number of industries including the Railway Carriage Factory, spare parts factory and rosin factory. Such industries would create job opportunities which are likely to add to the population of this urban area.

It is essential to study the trend of population growth in the foreseeable future and to work out the requirements of housing and other facilities and find out ways and means of meeting them.

People flow like water from villages to cities. This flow cannot be reversed; but can be reduced. The needs of the villages must be conceived and adequate facilities provided.

Urbanization in Gujranwala

Syed Hasnat Ahmad

Before going into details concerning the urbanization of a city like Gujranwala, it would be worthwhile to have a bird's eye view of the whole problem.

Our country is passing through the critical stage of economic development. Considerable development has taken place in industrial as well as agricultural fields, especially during the Second Five Year Plan period. Great stress was laid on industrialization and the overall results achieved have been most encouraging and in some cases quite spectacular. There has been some criticism of the so-called slow economic progress in Pakistan especially by people who have been to countries like China or Japan. The pace of industrialization, according to them, has not been up to the mark. As a matter of fact, every country has its own natural resources and relevant problems and one should not expect miracles to happen in the economic field.

Under the present circumstances our progress has been quite satisfactory. Factories are coming up in nearly every big town and city. Industrialization has naturally brought in its wake a lot of complex problems such as the exodus of a large number of villagers to the cities. Nearly 84% of the population of our country is living in rural areas and the total area of West Pakistan is 3,10,236 sq. miles, but unfortunately only 22% of the total area is under cultivation. There has been some progress in the agricultural sector also, but as compared to the industrial sector the results have been not so encouraging. There are some enthusiastic zamindars who have tried to modernize farming and have achieved food results but by far the majority of population living in the villages has been left high and dry. In far-flung areas even now the same orthodox and primitive methods of cultivation are being used. The villager is still an unenlightened person who can hardly make his both ends meet. He has to labour for the whole year, but sometimes his earnings are not sufficient to pull him through the year and he and his family live on the verge of starvation. Except for a few landlords, this applies to the whole of village community. The villagers who have moved to a nearby city are comparatively better off. Their income while meagre is at least assured.

The village population is increasing rapidly. Consequently the pressure on small holdings is gathering momentum and in most cases saturation point has already been reached. A father who owns 12 acres of land cannot feed his ever increasing family. The male members of the family have to explore other avenues of income. The majority of able-bodied and semi-skilled persons from the villages have started pouring into cities.

There is also the impact of modernisation. The villager of today is not the same as he was a decade ago, thanks to the radio and transport facilities. He has been, in most cases, to a city and has seen the present amenities of life. Probably he has seen a cinema show, smoked a cigarette or eaten a tasty meal at some restaurant. Naturally he becomes enamoured with urban life and tries to settle down in a city. Man is by nature restive and once the urge for knowledge breaks loose there is no end to it. One step leads to another. Already the so-called big landlords have left for the cities where life affords more opportunities and where the amenities of life are in abundance. The poorer brethren are also blaxing the same trail. It has created complex social and economic problems.

Every area has problems peculiar to its geographical surroundings. I would confine myself to problems of urbanization concerning Gujranwala city. This city had a population of 84,545 on the eve of independence. During these 19 years it has outgrown itself and at present stands at 2,50,000. The housing projects have not kept pace with the rapid increase in the population. Some colonies such as Satellite Town and Model Town sponsored by the Gujranwala Improvement Trust have come up, but mostly they have catered for middle and lower middle classes. The poor still live in the slums of city. Sometimes a family of 8 or 9 members has only one room to itself. This congestion results in unhygienic conditions which lead to spread of diseases. Accordingly nearly 5% of the population is suffering from tuberculosis. This has created an alarming problem. An organization of social workers has opened up a T.B. Clinic which is always thronged by the suffering humanity.

Law and order : Over-population has also affected the law and order situation. The present strength of the Magistracy and the Police is absolutely inadequate to deal with the population. Proper check cannot be exercised and the natural consequence is an increase in crime.

Master Plan : The city is plagued by a large number of ponds of stagnating water. There are as many as 17 such ponds. Some of them are very large and deep. On the banks of these ponds are situated houses belonging to poorer classes and in the absence of any water works most of the population has to depend on hand-pumps. The dirty water is pumped out and drunk. Great endeavours have been made to deal with

this problem. A number of plans were prepared, but as they were executed half-heartedly, the results have not been encouraging. The city itself is shaped like a saucer. It is higher on its sides and lower in the middle with the result that there is no drainage system. All the sullage water and filth of the town gets into these ponds which are hot beds of mosquitoes and germs. It requires great efforts to deal with a problem of such magnitude.

There is no master plan of the city. The Government Department with such type of problems is too busy and the private firms demand too much. The results are quite obvious. The various development schemes are being carried out haphazardly solving few and creating more problems.

Water Works : Till recently there were no tubewells in the city and the population was dependent upon the hand-pumps alone for drinking water. A few years back, however, this problem was taken up. A plan was made. Since then only three tubewells out of eight have been installed. It is planned to complete this work by 1970 at a cost of Rs. 1,47,000. Now the American consultants have revised the estimates to Rs. 7,70,00,000. One-third of this money will be financed by the Government, one-third by the Municipal Committee, Gujranwala, and the balance will be given to the Municipal Committee was of the opinion that it was not possible for it to execute this scheme due to paucity of funds and as the whole scheme was to cost them nearly Rs. 5,13,34,000. The Government intervened and the Municipal Committee has been directed to own this scheme.

Power : At the time of partition there were nearly 400 industrial connections. With the coming up of industrial estate and a number of other big factories, the number of factories and consequently the number of connections has risen by leaps and bounds and at present they are 2,464 in number. Besides this thousands of private connections were given. As the population increases there is more and more consumption of electricity. The demand is great but the supply position is not very happy. Of course this has complicated the matters and the regular shut down of power supply has become a permanent headache to the factory owners. This problem cannot be tackled at the district level. We can only wait and hope for the best.

Transport : Gujranwala City is situated on the main Highway between Lahore and Rawalpindi. A large number of transport companies have cropped up. Their number now stands at 25. The traffic on the Grand Trunk Road which was re-built a few years back is so congested that it is humanly impossible for any one agency to control it. There are fast moving cars and buses which are always in a hurry and they leave a number of accidents in their wake. In the city itself the only transport being used

is the tonga. I am informed that there are 1,200 tongas in the city. At the time of independence the number of tongas in the city ranged between 500 and 600. There is no question of running omnibuses as it is simply impracticable. The streets in the city are very narrow and distances are short. Motor rickshaw can be an alternative, but most people think that the local population will not patronise it. Certainly no rickshaw is big enough to carry even one hefty *phelwan* and every other person in this city is a *phelwan*.

Health : The dirty pools and millions of virulent germs have had no effect on the health of these masses of flesh. They feed themselves very well. The lassi and nan-kabab shops are flourishing. They are swarmed by flies and mosquitoes which are sometimes roasted with the meat and relished by the *pehlwans*. Nobody bothers. Probably this complacency brings immunity to germs and filth. People from Lahore and other districts come to eat the famous *tikkas* of Gujranwala. The mosquitoes probably die after biting a *pehlwan*. They retaliate by assaulting the poor refugees from Jammu and Kashmir and other ill-fed individuals or Government servants, especially the emaciated clerical and other low-paid staff. The local inhabitants have developed immunity to diseases and the bad water from the filthy ponds proves a tonic as it might be full of vitamins of a rare type hitherto undiscovered. This is the darker side.

Some Urban Developments : There are purple patches too. The Municipal Committee which is very rich and the Improvement Trust have their own plans. The roads are being widened, the houses white-washed and cleaned. A District Headquarters Hospital is being built at a cost of Rs. 20,00,000. An ultra-modern bus stand is going to be built. The site has been selected and plans prepared. It will have a big hall, an air-conditioned restaurant and other amenities. An over-head bridge is planned at a cost of Rs. 25,00,000. This scheme is complete. Of course bottle-necks will take sometime to remove.

Two new degree colleges one each for boys and girls with hostels are functioning. More and more houses are being built. " D " type quarters are also being built in the Satellite Town Scheme. The most spectacular feature has been the setting up of an Industrial Estate. There are 21 factories and when completed it will have 100 in all. These are ultra-modern and manufacture all sorts of articles.

Summary : Everything possible is being done. But despite a very active Family Planning Department, the population is on the increase. Even the deadly mosquitoes and other germs cannot stop it. The problems will grow more and more formidable. The remedies are also being sought out but only time will tell who wins the race.

Master Plan: A Tool of Planned Urban Development

ANDRZEJ B. JEDRASZKO

DEFINITION

Any plan worth the name has to contain at least four major elements :

—the formulation of goals (or goal) and their heirarchy,

—analysis and assessment of the existing situation and the situation under which the execution is likely to take place,

—choice of measures to be applied,

—ways of their application to achieve goals.

As it can be seen from the above, the term "plan" means both setting up of targets and formulation of principles which lead to achieving them.

The need for planning in industry, business, agriculture, even personal and family life is either developed, recognised or at least its importance well understood, irrespective of different economic and political systems. Planning in those fields is treated as something obvious, having its traditions and is often a must for survival or success. One may say that there can be as many types of "planning" as there are activities to be planned.

There are, however, important differences in subject, scope, method and emphasis among various types of planning. What is more important, there are also different degrees of social recognition and individual acceptance depending on the subject of planning.

The other word used in the title of this paper is "master", which includes five pre-requisites :

—comprehensiveness in scope

—containment of the whole territory involved

—affecting all the organizations and individuals

—superimposition as the result of standing for goals of highest heirarchy

—decisive and commanding character.

Objects of Master Planning

Master plans have been found to be a useful tool in numerous fields of human activity ; in many of them they have even become indispensable. To give only a few examples :

—undertaking construction of industrial establishments require master plans, *e.g.*, oil refinery or steel mill in Karachi, comprising a period of 10—15 years

—implementation of the Indus Basin Water Treaty required preparation of master plan in the field of water economy for the period exceeding 50 years

—expansion of the Karachi harbour requires working out of a master plan for a period up to 50 years.

It is clear from the above instances that the objects of master plans can vary. But whatever the object, the need for the master plans is obvious and the necessity for their preparation is treated as an acknowledged "must".

When it comes to urban areas, however, the need for a master plan to direct their development ceases to be so obvious, many doubts are brought up and many difficulties arise. The social recognition of the need apparently fades away. While the planners are convinced that city building and reconstruction requires plans to be worked out and reliably implemented, the social groups and individuals who are to benefit from those plans become restive and even hostile to the very notion. In the contrary to the clearly defined goal in building a factory, dam or extending the harbour facilities, there is no such unity in urban areas, which consist of multiplicity of agencies, groups and individuals, each pursuing its own goal, usually contradictory to more general urban planning objectives. What is more, human group and individual attitudes change depending on which function they perform or which capacity take on, *e.g.*, a plot owner resists shifting the fence on the corner of a street intersection to improve visibility and avoid accidents but he being a driver will demand it. There is also a phenomenon which could be called social inertia—the most obvious and beneficial things for a community are the least understood unless they affect an individual directly.

The Cities

Nature of cities

Many difficulties in application of the principles of master planning to urban areas originate from complexities of those areas and our limited

knowledge of the urban phenomenon and its evaluation. Although everybody seems to possess a clear picture of what an urban area is, the subject becomes very elusive when one attempts to classify it in a scientific way for the town planning purposes.

Until recently the city has been understood as a static configuration and most of the studies were aimed at its morphological measurements and classifications.

The new approach comprehends the city in a dynamic process rather than a static configuration. It is less concerned with considerations of form and more concerned with consideration of process, particularly the interaction among city dwellers. It leads to different conception of the city and of policy issues associated with urbanization.

Instead of asking what the urban system is, the question is how it works. Numerous recent studies, like inter-regional commodity and income flows, social mobility, transportation costs, social organization and behaviour seem to concentrate on flow of money, goods, services, information etc. and decreasingly on stock of people, goods, buildings etc. It appears that it is this flow which shapes opportunity and welfare.

Thus, social organization and human interaction are replacing density and place as the foci of inquiry and political strategy.

Probable future growth

However controversial the scientific perception of the city can be, there can be little doubt that the urban areas have been growing very rapidly and there is little ground to believe that they will cease to in the future. That situation is bound to aggravate the already difficult and complex problems exposed by the urban areas.

Throughout centuries the economic, technical, cultural and other progress was mostly born in cities and emanated from them. There is no reason to assume that cities cease to play that vital role. Hence, it is important to realise which stresses cities will be faced with within the next couple of decades, which can be illustrated by giving just a few examples :

—would population may increase from the present 3 billion to be about 6 billion by the year 2,000 and the urban areas may have to accommodate 2/3 of that number,

—in the year 2,000 the doubled world population is likely to occupy

three times as much land as it does now. If that rate continues, the available land resources would be nearing exhaustion by the year 2,050,

—a tolerable urban environment will have to be built in the second half of this century for 13 times as many people as in the previous 150 years. To do it construction would have to be about 40 times bigger than it is at present,

—it is estimated that within the next 40 years world construction, located mostly in the urban areas, will equal the total of construction during the last 6,000 years.*

Pakistan is following a similar path. The demographic forecasts indicate that the total number of population is likely to rise to about 140 million by 1975 and to 180-185 million by 1985. At the present moment, the country is at a very low stage of urbanization and one can expect that the urbanization process in Pakistan is bound to be dramatic. According to the estimations of the Planning Commission, the number of city dwellers will increase from about 14 million (in 1964) to about 22 million in 1975 and to about 60 million by 1985.

Master Plans for Cities

The most apparent symptoms of development of a city are the growing size and scope of varied activities due to strengthening of existing functions or acquiring new ones increase in the number of city's population as well as city's physical extension. In the process of development different forces are at play, different groups and individuals pursue different aims, usually of a contradictory nature. Since those activities take place on the same area and affect in a way the whole city and all the inhabitants, leaving them entirely to themselves may lead to undesirable economic and social results. Realization of those dangers had, in fact, led to emergence of town planning as a tool to regulate and influence the growth of urban areas.

The scope and technique of town planning has been changing with time. The state action in that field, introduced in the 19th century was very slight and limited to ameliorate legislation dealing with problems of bad housing and, allied with those, the problems of the poor working classes and public health in general.

In the inter-war period, emphasis started passing from the design of residential estates to the more general question of allocation of land

* Report of the First Session of the Committee on Housing Building and Planning, 1963 (UN E/3719/Rev. 1 25).

among various uses. Planning was beginning to be seen less in terms of visual appearances, health and amenity, and more in terms of social and economic functions. During the years of depression close interrelation of housing, unemployment and industry became obvious. Housing and industry, however, could not be considered without communications. And sanitation ceased to be thought of as a major factor in itself, but was included into housing. Town planning gradually became to be concerned with all the institutions of the society and not merely a drawing board exercise in demarcation of plots. It became an economic function in the allocation of land for particular purposes. It went far beyond the skills of architects and engineers.

Since the last 20 years, when due to the size and rate of population growth as well as trends of urbanization and industrialization the availability of land which is the key resource and precondition for town planning has become a problem, it has turned out that the public authority must be given wide power to intervene in order to secure a more judicious use of land.

Without going over the history of town planning and its controversial theoretical aspects, it could be said that it is primarily concerned with coordination by reconciling conflicting claims for available urban land. It has got a distinct subject, scope and developed certain methodology. Its "end product" is the physical development plan which, above other functions, seeks to provide a physical framework within which many and varied types of activities: economic development, housing, transport, social services, municipal facilities etc. can be carried out without misuse of land, wasteful competition or creation of undesirable environmental conditions.

Form and Scope of Master Plans

The master plan usually takes up a form of a set of documents:

—various analytical and synthetical reports

—maps of probable or desirable development on suitable scale.

Those documents illustrate the following major groups of problems:

—geographical environment

—social structure

—physical and technical structure

—economy

—law and administration

Every problem is dealt with in a dynamic way, beginning with the situation existing at the starting point of the preparation of the plan, the so-called urban horizon period (20-30 years, in some fields longer), perspective period (usually 15 years) and ending with other "stages" thought relevant in connection with development of the country or of the region, often corresponding to the periods of the national economic plans.

The master plan comprises the whole area deemed to be necessary for development of the city up to the urban horizon period. It does so irrespectively of the existing ownership and administrative boundaries.

The scope of exactness and the map scale of the elaboration differs according to the period concerned (more detailed for the present state, generalised for the urban horizon year), size of the city as well as particular needs or problems arising in a given city which may require special approach *e.g.*, due to their decisive character.

FUNCTIONS OF MASTER PLAN

If one puts aside the question of the ultimate goal (or goals) of the master plan, the plan may perform the following direct functions:

—economy in the use of land

which finds its manifestation in defining the desirable use of all the land in the city (avoidance of waste of land). It takes place both while designing the structural concept of the whole city as well as while designing its various physical components (using a system of certain accepted standards)

—functional order

which consists in reconciliating contradictory and competing claims for land and its uses in the economic, sanitary etc. sense.

—technical correctness

expressed by designing technically feasible dimensions (length, width, height), shapes and gradients of particular land uses.

—orderly stage development

development at the every stage of the plan. That stage approach provides a background for checking city dispersal, economy in infrastructure investments and shaping the city in such a way as to be an operational unit at every stage of its growth.

—co-ordination of investment plans of various departments and agencies in place and time

made open to them by defining the need for those investments in relation to a particular area of the city. This concerns social services, utilities, transportation etc.

—base for preparation of designs for various city utilities and transportation

established by defining most of the technical data and location of future development necessary for designing the network of city utilities.

—base for preparation of detailed town planning schemes layout and building plans, both in the existing parts of the city and new areas chosen for development

—base for enforcing planning and building control

—base for enforcing health and building standards

—base for securing certain aesthetic order and amenity

A master plan for an urban area usually provides for basic preassumptions to perform the above mentioned functions. Which of them, however, are actually performed depends on many socio-political and institutional factors.

Methods Applied

An outline

There are several methods of preparation of master plans of urban areas currently in use. Without going into differences, details and nomenclature, one can distinguish some basic common elements of these methods.

They could be summarised as below:

Research

Historical trends

Geographical environment

Existing state :

Socially
Economically
Physically

Technically
Institutionally

Inventory of potential state :

Changes in progress

Projects under preparation

Decisions taken

Attitudes and preferences

DEFINITION OF GOALS

ANALYSIS AND ALTERNATIVES OF PROGRAMME

Defining basic city elements:

Types—forecast of probable character of demand
Quantity—forecast of probable size of demand
Quality—set of desirable standards

Possible location of basic elements (city structure)

Defining auxiliary city elements
(types, quantity and quality)

SYNTHESIS

Design concept

Graphical delineation

Description and presentation

POLICIES

Means and ways leading to actual implementation of the goals represented by a chosen city setup.

Research

Since town planning has developed as a protest against physical urban phenomena resulting in social evils, it obviously concentrated primarily on study and research of the existing conditions in cities. It has been particularly characteristic for the countries influenced by the British town planning, where main stress has been put on research in that field. That approach is also traceable in Pakistan—the first efforts in the sphere of preparation of master plans for bigger cities, initiated recently by the Communication and Works Department, Government of West Pakistan, concentrate also on studies of the existing state. While that approach is undeniably of an essential importance for understanding the urban

environments to be planned and its potentialities, the real core of the problem lies in the methods applied in the "synthesis" of the master plan and its implementation (policies).

Goals

There can be little doubt that the ultimate objective of "planning" is man. The man, however, does not exist singularly. He exists within complex, growing and changing societies located in definite environments producing acute sociological and ecological problems. That is why priority should be given to "social planning" leaving physical, economic and other planning subordinate to it.

Arriving at such a general conclusion is relatively easy, but its practical implementation encounters several basic difficulties. The most obvious question which comes up is the model of the future man (or society) as the object of planning. It is a very controversial issue and the answers sought range from formulating an image of society by, say, year 2,000, to a negation of the whole idea as irrational and impractical since the society is not likely to ever present a unified picture.

Another point of discussion is the period to be selected as the " horizon " for formulation of the model society, closely followed by the problem of geo-economic differentiation of that model.

The other difficulty derives from the fact that while social life and patterns change constantly, the structures erected by people tend to be of a permanent character (at least 50—100 years) and are basically inflexible making their adjustment to the changing social conditions almost impossible.

Since many basic questions are yet expecting their answers, the goals of social planning remain still either unidentified or set up in voluntary and arbitrary ways. The major drawback, however, is the fact that social planning, whatever its achievements in particular small-scale cases, has not yet demonstrated its capacity as an efficient tool to smooth social transitions and operations. It is still mostly concerned with finding and examining what is wrong and much less with actual remedial actions. The knowledge needed to understand and manipulate society is still very scare. There is no certainty about medicines to be used and their administration either.

Analysis and synthesis

Traditional town planning depended mostly on an assumed set of standards and certain geometrical and technical correctness of the design.

Not much attention was paid to the question of economy and sociological impact of the chosen solution. The main stress was laid on skill in designing of physical components of urban organism.

The progress in theory and techniques of master plans and their application has been recently most pronounced in the field of analysis and synthesis. Several interesting approaches have been developed by applying to urban problems methods, largely mathematical, which have been successful in other field, particularly in economics (*e.g.*, optimatization linear programming, etc.). Those attempts have created new perspectives, introduced entirely new tools and set up new yardsticks for evaluation of the possible solutions to the master plan.

A few master plans which were prepared or are being currently worked out in Pakistan follow a very traditional approach. They are also considerably handicapped by absence of a set of town planning standards which would reflect the geographical environment, economic situation, social tradition, technological and techno-cultural level etc. of the people and their region. One may get the impression that planners are not fully aware of the "analysis-synthesis" part of the planning process and progress taking place in this field and that the importance of that process is not realised by the authorities concerned. Under such circumstances the "analysis and synthesis" of the plan tends to be substituted with the skill of drawing. If master plans are expected to be an effective tool in development of urban areas, they should be worked out in full awareness of the principle that the physical aspects of the city are not separable from the economic and social, and therefore should be treated in concert with them. A city planner should be concerned with physical planning, economic planning and social planning. He should possess a broader knowledge of the structure and forces affecting urban development. Planners and specialists have to become sensitive in addition to code enforcement and other traditional tools, to the effects on quality and quantity of any city programme exerted by finance policy, social welfare, city economy etc. One should not, however, underestimate the skill in designing of physical components of cities which is essential and necessary to let the physical parts fit together.

Policies

This is the most important part of the process of planning consisting in devising ways and means leading to decision-making commensurate with the prepared "synthesis" of the plan.

In traditional town planning that part was either neglected or limited to suggesting some by-laws to be accepted by the authorities concerned. This approach was justified by the limited scope of town planning (mostly

improvement of sanitary environment and health) and their small-size applicability.

The later evaluation of town planning led both to widening of its scope and broadening of scale. Town planning began to affect in a way or another almost every organization existing in a city as well as every individual. The question of overcoming the multiplying contradictions and conflicts and setting up a basis for rational decision-making has become the major problem of town planning.

Traditional Planning and some of its Shortcomings

City planning has traditionally perceived the city as a physical entity whose signal traits are size, shape and density. This perception has encouraged morphological measurements and classifications and has led to development of certain methods applied in the preparation of master plans. Although those methods vary in many respects, they display many basic common features.

Those methods could be called "end stating" ones and they usually rely upon 3 key decisions :

— sets of standards for the sizes, location, capacities and other physical dimensions for highways, building, sewage system etc.

— long-range forecasts of demand and professionals' judgements of desired future conditions

— predicting future goals of future population.

Rarely have been the origins and rationale of the above decisions made explicit. They usually derive from the ideological heritage of the individual professional groups, which have introduced the traditional planning methods applied at the moment. Those groups have been skilled in designing the physical components of cities and consequently their approach has been largely limited to functional correctness and shape of the city and not much concerned with the economic and institutional framework within which the carrying out of a master plan has been taking place.

The criticism of the traditional methods of planning has been developing for some time. We are interested here in two important points of this criticism, which could be described as follows :

— assuming that the targets are properly defined, is the choice of measures to achieve them the best possible ?

—how to ensure actual carrying out of the actions necessary to provide a link between what is desired in the future and what exists now.

Multiple Concept Approach

In view of the disadvantages and doubts of the traditional planning methods, many planners have been searching for other ways. Most of the explorations led to developing methods for formulating goal-directed courses of action. They usually consist of 4 basic steps :

—consideration of all the alternatives open to the decision maker within the existing situation and established goals

—identification of all the consequences of each of the adopted alternative

—evaluation of all the consequences of each of the alternative

—selection of the preferable alternative (optimalization of the whole system).

This new approach constitutes a departure from traditional "handicrafts" methods where practically only a few logical alternatives could be compared ; it introduces huge numbers of possible alternative solutions which have to be compared among themselves, rendering such a comparison almost impossible to be done within a reasonable period of time even by the most efficient people using the best available equipment.

The development of the new technique has been made possible by introduction of computers. The computer, by virtue of its ability to manipulate enormous amounts of data and to simulate the behaviour of complex human and material systems, is bound to become an essential tool of planning. The computer allows to manipulate as many variables as can be formulated in logical and numerical terms. It makes it possible now to deal with large masses of data pertaining to large numbers of variables. Computers are especially useful for dealing with mass phenomena, *e.g.*, traffic control, allocation of resources, demand for goods etc. But they cannot answer individual cases, which town planner is confronted with daily, of planning control, building control etc.

However, impressive the results of using computers in the process of city planning may be, one should not overemphasize their role. A computer does not replace the human brain ; it gives answers to the questions asked but the formulation of proper questions is up to the human brain. The computer is only a tool which cannot replace actual decision-making ; that will be always made by human individuals.

An interesting study has been prepared in connection with the work on the master plan of Warsaw, Poland. Planning in Poland is carried out on the base of the "Physical Planning Act". This Act provides, among other things, for preparation of master plans for all the cities in the country. Those plans are prepared for the perspective period (25 years) and for the 5 year periods (stage plans) coinciding with the national economic plans.

The study referred to concerned the stage plans (development plans) of Warsaw and was intended to provide an answer to the question, when particular areas (districts) of the future city should be developed in order to assure the most economic use of resources invested into the city's infrastructure. In other words, the task was to define the sequence of development of different city areas so as to minimize the cost of land preparation.

The following elements of infrastructure have been taken into consideration :

—combating unsuitable physiographic conditions, (earth moving, drainage, additional cost of foundations etc.)

—removal of the present non-conforming uses and users (agriculture, villages, small houses etc.)

—providing the area with the following facilities (infrastructure) which were found to be of essential importance for the analysis :

—sewage

—water supply

—central heating

—gas supply

—rapid transits.

Each of the above items got divided into "source" and "transit line". Several alternative technically sound systems have been designed and related to various areas of the city feasible for development in each alternative.

The cost of preparation of every area of the future city depends on the combination of all the above mentioned factors and the period of time when they were supposed to be taken under development. The task given was to define those cost factors for every feasible alternative (after exclusion

of illogical ones) for a given amount of population to be accommodated in the city. The technically feasible alternatives were evaluated and when superimposed augmented the number of possible solutions to more than 7 millions. The calculation were carried out by using a computer and the received results were ordered according to the growing cost of land preparation per one inhabitant. As it turned out the difference in that cost exceeded 1 : 20. That indicates the possible range of capital investment effectiveness depending on the division which area of the city should be developed within a given plan period and gives an idea of what economic gains could be achieved by adopting tools of modern planning technique. The final selection of the area to be developed was made from among the first 200 variants since it was found that there were some other essential factors which eluded a mathematical formulation but which were of importance for the development of the city. However impressive the result of that optimalization study could be, it was treated only as a tool assisting in the decision as to the direction of city's development and not as a decision itself.

Decision-Making ; The Crucial Part Of Planning

Rationalization of decision-making.

Preparation of the design of the desired future city constitutes only one part of the preparation of the plan ; the other one which, in fact, is the most essential is formulation of ways leading to the decision-making commensurate with the established goals and securing their implementation in type, quantity, quality, place and time. In other words, the question is how to influence the actual city-making process to follow the decisions contained in the design how to translate a goal-orientated master plan into operative goal-action statements for decision-making within and outside the government.

The master plans prepared with traditional methods was not concerned with that question at all or only in a very marginal way by suggesting certain bye-laws or codes of negative, regulatory character. They tactilly assumed that there is an identity of goals established in the master plan with the goals pursued by groups and individuals living or linked to a given city.

This usually not explicitly stated notion has led to some attempt to use some modern techniques which were developed to a high success with production processes and complicated weapon and missile systems. One of them is the "critical path method". It consists roughly speaking, in defining all the activities to be carried out to achieve a certain goal, finding their relationships and assessing the time needed for execution of each of them. That information permits working out a network of related

activities leading to achievement of a certain goal and finding those which constitute a chain having decisive character for the whole system. That chain is called "critical path"—hence the name of the method. Using this method it is possible to set up a network of related activities leading to the practical implementation of a master plan in the most efficient way.

Those new methods although theoretically very interesting run into basic difficulties when attempted to be introduced to the process of city planning. By their very nature they require a measure of goal consensus, a quality of prediction, a hierarchy of command and a degree of control that do not exist or exists only exceptionally (*e.g.*, planning and construction of entirely new cities) in the normal context of public affairs. They call for prompt supply of reliable and uptodate information which is a very expensive commodity. They also require considerable coordination and centralized managerial control which is seldom found in urban affairs.

Socially and politically, the urban area consists of multitude of individuals and separate groups, each pursuing somewhat different bundles of objectives, participating segmentally in decisions that affect their multiple goals and interests. The process of decision-making in the city differs basically from that of a single-function government agency or an engineering firm since such a unitary setting does not exist in the urban areas. Only rarely it is possible to make decisions across many bodies.

A quite different approach has been recently tried out which consists in developing formal mathematical models to simulate the working of the city and to assist analysis at alternative goals, policies, programmes and plans. The objective is to create, with the assistance of computers, a replica of the real world which would enable tracing down the process of action and reactions of various bodies operating in the city, testing alternative policies and action and their evaluating.

Studies carried out along this line try to relate municipal investments to different programmes and actions of city government that can accomplish varies investment objectives. Due to the complex nature of the city those studies got limited to some particular urban problems. In this field some interesting experimental simulation models were developed in the USA*.

The new methods mentioned above are still in the preliminary stage of their application in urban planning. They represent basically two different approaches to the problem of how to secure the actual implementation of the designed city plan and in that sphere they are particularly concerned

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* In Pittsburgh simulation model is to measure the impact of the urban renewal on some municipal indicators (tax returns, availability of employment, housing vacancies). In S. Francisco a model has as its objective the testing of public actions on the residential private investment market in urban real property.

with the institutional prblems of the implementation which are undeniably of decisive importance in growth and development of urban areas. Those two approaches could be summarized as follows :

—studies carried out in the field of perfection of working of a "central command for planned development",

—studies concentrating on understanding of actions and reactions of social groups and individuals making up an urban area, aiming at perfecting the "prediction of the result of a planned action".

Following the above basic two approaches, one could say that the alternative in planning of the cities is either to try substantially modify the "prediction" method to make it more adapted and applicable to the complex and still not sufficiently know urban setting, or to create a single, powerful decision centre to carry out the planned development of an urban area.

Need for professional planning decision centre in Pakistan

Without going into merits and shortcomings of both approaches, one could say that the choice has got to be decided upon by the situation of the area they are going to be applied to. The second approach requires extensive basic studies, reliable information and their continuity, scholarly techniques of the highest order; its application to a city as whole is very difficult due to the multiplicity of factors involved. Even assuming that approach could be perfected and simplified, it is doubtful whether it could be effectively used in developing countries where pre-requisites for such an approach hardly exist.

Under such circumstances it seems that it is the "central command" idea which should be followed. In practical terms it means establishing powerful planning authority which can secure a real coordination of the city's development. That authority should have both positive (undertaking of projects) and negative (control and restrictions) powers.

This is exactly an idea which is strongly opposed in Pakistan urban areas. That opposition, however, appears to be of mostly irrational and traditional character. The departments and agencies involved seem to be afraid of losing a part of their power by admitting that coordination is a precondition of any planned activity. Besides, there is a lot of misunderstanding as to which questions have got to be coordinated.

The urban areas in Pakistan are administered by several authorities. Each of them was established separately and each considers itself to be an exclusive authority over the area governed or owned by it. Consequently,

each of them framed separate by-laws or regu*lations* concerning building activities which sometimes concern also physical planning.

The idea of planning of a city as whole had not been recognised before partition; after it, no Act has been introduced making the preparation of master plans foı a whole city obligatory.

Under such circumstances, each of the authorities or agencies working in a city has carried out planning of its sector of that city according to its needs without being concerned with what the neighbouring authority might have been planning. As long as cities were small and grew very slowly that approach could have been a sufficient answer to the needs. But with the explosion of cities in Pakistan and their physical expansion, that approach became absolute and not solving any of the new urban problems.

Some efforts to coordinate the rapid development of cities were made. They took shape of the improvement trusts which had quite a long tradition on the subcontinent, as well as development authorities. Both of those bodies, however, were not concerned with planning; they have been created in order to carry out certain investment programmes and their responsibility was usually limited only to the areas affected by their operation. The same is also characteristic for the West Pakistan Housing & Settlement Agency which was created to carry out the refugee rehabilitation programme.

Almost every department, agency etc. undertaking any investment in the city takes on the function of city planning (consciously or not) and its investment affects and changes the physical outlook of the city. Those building actions can be of a local importance only but they can also (add very often do) concern the structure of a part of a city or even the whole city. Every authority is very "status conscious" often forgetting that planning mistakes can be rather avoided by coordination and judicious designs than by being not concerned because of the status. One may get an impression that the difficulty of physical coordination of city development derives from an apprehension that it may endanger rights and powers of the authorities concerned.

Small towns, due to their limited physical extent and activities present relatively few town planning problems and do not require special machinery to coordinate them. Big cities, however, are subject to the numerous actions and investments framed and executed independently by various bodies and individuals. In order to coordinate their actions (at least physically) a "town planning authority" should be established. Its power should extend over the whole area deemed as the city area in the future, irrespectively of the fact who owns or is vested with the hand The

powers of the authority should concern only basic town planning decisions which derive from the master plan, while planning decisions of the local character could be left under the present conditions with the bodies existing in the city. Such approach could eliminate many objections being raised by them as to the question of the "town planning authority" and made an agreement on that subject much easier.

The "town planning authority" should be a body able to direct and influence both the development and renewal of a city. For that purpose it must have both negative (regulatory) and positive powers (undertaking of schemes). Its positive powers should contain these factors which are essential for directing city's expansion besides framing development schemes, *i.e.*, it should be responsible for undertaking investments in three basic spheres: major road system, bulk water supply system, and sewage/drainage system. The authority should also have powers to issue binding outlines and approve any town planning schemes intended to be executed in the city and issuing town planning "no objections" certificates.

The "town planning" authority would have to make decisions, which should be correct technically and economically and to supervise their implementation. For that purpose it must have sufficient and qualified staff both in the field of designing and administration.

The question of establishing a "town planning authority" in big cities is an urgent one. That would constitute the first step towards co-ordination of the development of cities, at least in the physical sense to begin with. The alternative is either to let cities grow by themselves following the idea of fragmentary "scheme-orientated" planning, which will ultimately result in a need of undertaking exorbitantly expensive public action, or to establish now an authority for co-ordination and for directing urban development process.

Urbanization and Town Planning Problems

M. AHMED ALI

The rapid urbanization that is taking place in Pakistan is a phenomenon which is being commonly experienced in almost all the developing countries in Asia and Africa. Urbanization is coming like a steady and growing storm. As things are at present, there is nothing that the government or the people can do to check urbanization or control it in any manner. The only thing to do is to face the great challenge and to analyse the methods and means by which it can be met. In Pakistan there were 56 cities in 1951, having populations of 25,000 and above. The corresponding number for 1961 is 76. In terms of population, it is estimated that the urban population of Pakistan was about 10% of the total population in 1951, while it went upto 13% in 1961. In terms of increase in urban population, it was over 62% in the decade. This gives an average of 6.2% increase per year.

The first and the foremost fact which has to be realised is that the problems that the city may be facing today are nothing compared to what the city must prepare to face in future. Hence, the most important thing is getting into a state of readiness: to think, plan, and provide for the oncoming flood. It is this state of readiness, which brings the problems of town planning of an urban area to the forefront. The fact is that if the concept of physical planning and expansion of the city is grasped properly by the community and the needs and requirements charted out well in advance, a whole lot of baffling problems would not arise at all with the growth of the city. The main instrument with which a city has to equip itself into a state of alert is the Master Plan.

A Master Plan is a broad outline, for guiding the future development of a city or a region, for a period of twenty to thirty years, expressed in the form of a comprehensive map or series of maps, supported by a report containing the basic principles or policies, and programme for the development of the city. Its aim is to encourage harmonious and inter-related growth of various functions, *e.g.*, housing, work place, recreation, commerce and industry, through their rational physical arrangements and healthy co-relation. The plan defines the future extent and scope of the city in relation to the region and the topography and projects possible growth. It also indicates the future pattern of transportation and communications.

It indicates the broad land use requirements for housing, industry and commerce, and also ear-marks spaces for civic, business and cultural activities, health institutions, etc.

The first step in the preparation of a (physical) master plan for an existing city is to have a thorough knowledge of all relevant facts about the city. As the plan is to project into the future, it is necessary to do basic research, (as distinct from mere collection and presentation of data) on the existing conditions and trends, *e.g.*, such important problems as the trends of population growth and economic activity etc. It is also necessary to forecast the future requirements of social services, such as community facilities, recreation, education and health facilities. After the surveys and research are complete, basic principles or policies for development are formulated. A plan and a programme for future are then drawn up.

A comprehensive list of studies that are required to be made by a team of experts prior to the preparation or undertaking of a Master Plan are as follows:

SURVEY & STUDIES

1. PHYSICAL:

Climate
Geography, Geology & Topography
Vegetation & Soil Conditions
Irrigation Pattern & Schemes
Historical Development
Maps of the city, scale available
Land Use
Age of Buildings
Housing Ownership
Land Values

2. POPULATION:

Population Growth & Densities
Population Characteristics
Age, sex, marital,
Education status
Religion
Place of birth

Vital Statistics
Births
Deaths

Employment
Income

3. COMMUNICATIONS:

Roads
Road Traffic
Railways
Air Ports
Port
Workplace & Residence relationship

4. CIVIC AMENITIES:

Education
Health
Recreation

5. SERVICES:

Water
Sewerage
Electricity—street lighting
Gas
Telephones
Postal Services

6. ECONOMIC BASE:

Commerce
Industry
Government

7. ADMINISTRATION:

Local Authorities, their functions, organizations and staffing.
Map showing boundaries of each authority
Existing legislation on building control, municipal services
Taxation and Finance.

It may be seen from the above list that the preparation of the Master Plan is not an easy job. It would require a study of many factors, courses and issues that it usually takes from two to five years (depending upon the size of a city) to undertake the surveys and prepare a master plan. It is of great importance that all concerned agencies, local authorities, government departments, utility companies are taken into full confidence during the preparation of the Master Plan. Usually it is the practice that while the Master Plan surveys and studies are in progress certain broad zonings or land use allocations and major communication alignments are fixed as a preliminary plan or outline plan. This plan is usually prepared without surveys and takes a very short time, say 6 months to a year to prepare. Such a plan is adhered to until a proper Master Plan is finally prepared and adopted. This is what happened in Karachi. It was as early as 1951

that the first preliminary Master Plan for Karachi was prepared. It was adopted for the purposes of planning control for the Greater Karachi area. This Master Plan laid out the broad lines of communications, *i.e.*, roads, highways and railways as well as zones for various uses, such as housing, green belt, industry, civic and commercial buildings. As far as the roads are concerned, the plan has been of great use because from the very early days of the development of Karachi it has been possible to implement the road proposals to the extent of requiring reservations to be left. In all the new layout plans, which were prepared for the development of suburban areas, the network of the Master Plan major roads was adhered to and spaces left for the main radial highways and the circular highways. In fact parts of these roads were built as part of the development of the local areas.

The main hurdle that the cities in Pakistan are facing is the fact that there is very little realisation on the part of the city-fathers and administrators for having a Master Plan or any town planning at all. Even highly educated individuals in full control of civic administration think that town planning is a mere luxury or a mere city beautification effort. The concept of Town Planning, therefore, is yet in the stage of infancy in Pakistan.

The second main problem is the legislative and financial aspect. Pakistan does not have any Town Planning Legislation, requiring urban areas to prepare plans for their long range development. The Municipal Administration Ordinance, 1960 contains a suggestion that a local authority may prepare a Master Plan. So do the Ordinances under which the Improvement Trusts and the Development Authorities have been created. Pakistan needs comprehensive Town Planning Legislation making it a mandatory provision for each city to have a town planning unit to carry out a comprehensive survey, and to prepare a Master Plan. Powers to administer and implement planning control with reference to the Master Plan should be clearly spelled out.

The third serious drawback for Pakistani cities is the fact that there is a great dearth of Town Planners. The dearth is mainly due to the fact that town planning has little recognition in the country. Service conditions and pay scales for Town Planners are so unattractive that very few people come forward to take up this profession. It is my estimate that the present requirements, if all the cities of Pakistan are to be covered by minimum town planning service, would be about two hundred and sixty, (at the rate of at least one Planner for at least 50,000 urban population) while there are only about 30 qualified Town Planners in the country. One can easily visualise how the existing number of Planners can cope up with the town planning problems of Pakistani cities. The fact is that the city of Karachi

alone requires 50 Planners with its booming population increasing at the rate of 125,000 persons per year and having a backlog of 600,000 people living in slums and 600,000 persons living in newly developed areas, which are rapidly deteriorating into slums due to lack of continuous planning, control and advice. There are about 300 licensed architects in Karachi and there is an estimated number of 6,000 buildings currently under construction each year. The Town Planning Unit of K.D.A. has to work under this pressure with only four qualified personnel, (one Town Planner and 3 Ekisticians). It is interesting to note that Karachi boasts to have the biggest town planning office of a single city in the country. In other cities of Pakistan there is hardly one Town Planner for each big city. As an immediate measure, scholarships in liberal numbers should be awarded for fulfledged training in Town Planning. No less than 12 scholarships a year for each Wing should be awarded.

As a result of this lack of appreciation of town planning by Administrators, absence of Town Planning Legislation and shortage of Town Planners, our cities are standing on the threshold of self-strangulation. Only short term and expedient measures are being taken here and there, instead of long range planning. Pending training of our own Town Planners, we will have immediately to launch the programme with the assistance of private Town Planning Consultants.

It is my view that a Master Plan and a Development Programme of a city should be given the same importance and urgency as well as status for the city's development, as is given to the Five Year Plan in the field of national economy.

Contemporary Approach to Planning

CHRISTOS ANTAHOPOULOS

It is useful that planners and related technical people should discuss with the higher level administrators problems of urbanization. Because of the nature of the urban problems, a number of types of scientists or experts are necessary to tackle them. The planner must also at a certain stage become an administrator. The administrator must understand the problems of planning and participate in their solution. Both of these will need to cooperate with the economist and the sociologist and the geographer and many others like the industrialist and the traffic experts.

INTRODUCTION ON PLANNING

The concern for our urban areas is rising from day to day and is fully justified. What is frequently inadequate is the way in which we are facing the problems. We usually take notice of the problem only when it is created and the remedies which we are considering do not go deep enough to attack its roots and tend only to offer a momentary alleviation of the burden. These are appeasement measures. What we actually need is a scientific approach that will direct and control future development. Only this will help us not to waste our natural resources.

When speaking of Master Plans, we are often thinking of regulating the traffic movement of our cities, defining the correct land use, drafting and applying the correct zoning regulations, achieving the proper relations as regards marketing, schooling, cultural and other facilities within proper community structures as well as many other aspects. This is not enough. What is essential in determining and solving these more limited problems is to define the relation of the city to its region; and to estimate realistically its potential growth in terms of general functions and economic activity. This includes the population growth, the area of land encompassed, and other aspects.

The factors that have to be considered in a master plan study are diverse and complicated, and the solutions that may be applied are numerous. In contemporary urban and regional studies, mathematical models and computer means have become necessary for the examination of the data and the development of alternative solutions.

This may appear theoretical and beyond the needs of Pakistan. This is not the case. To illustrate what is involved a case study will now be given. The case is the anticipated development of the Urban Detroit Area in the United States. This is a research project now being carried out with the cooperation of three groups; Detroit Edison Company, Wayne State University, and Doxiadis Associates.

Approach to the Study

This study was planned in several phases. The first consisted of an inventory of existing conditions. This phase was completed at the end of 1965 and its findings have been issued in a special report to the institutions concerned and will be subsequently made available in book form before the end of this year.

The second phase deals with forecasts; the aim being to study reasonable alternatives and evaluate them so that a course of action may be selected. This phase started a year ago and now reaches the point where a general methodology, specific models and their applications for the selection of several alternatives can be utilized.

The third phase deals with the implications of these alternatives for the development of the Urban Detroit Area. These implications will be analyzed, and the conclusions reached will be used as a basis for future study, programming, and action.

In view of the fact that the Urban Detroit Area (UDA) is only a small part of the Great Lakes region of the United States and Canada, it was found necessary to examine the various phenomena within the UDA against the background of corresponding evolutions within this wider environment. The Great Lakes region justified an analysis at yet another level, with a view to ascertaining the stage of advancement of a Great Lakes Megalopolis. Furthermore, the Great Lakes region had to be examined in a wider context, that of the United States and the southern part of Canada. The analysis proceeded, therefore, at four main scales, each successively contained within the next. The North America or Scale I, the Great Lakes Megalopolis or Scale II, the Great Lakes Region or Scale III, and the Urban Detroit Area or Scale IV.

Methodology

The Isolation of Dimensions and Elimination of Alternatives (IDEA) Method

The efforts carried out for the prediction of the future of large urban areas are usually based on one important assumption that is basically wrong.

This is the assumption that such areas are either static, or that they grow slowly. This, however, is not so. Many studies have proved that such urban areas grow at fast rates. The means for dealing with which have not as yet been developed. How big this rate is can be understood by the fact that between 1940 and 1960 the Detroit urbanized area almost doubled.

The only remedy for meeting such a situation is to study the area on a large scale, big enough to include all possible dynamic changes in the foreseeable future, both in terms of space and of time. A preliminary study of how far the Urban Area may extend has proved that it can cover a surface of 23,000 sq. miles, 200 miles from North to South and 150 miles from East to West, including 37 countries (25 in Michigan, 9 in Ohio and 3 in Canada). Beyond these limits UDA cannot expand as such, as it enters the urban areas of Chicago to the West and Cleveland-Pittsburgh to the East.

The Urban Detroit Area has to be studied over several decades, as major projects of Government or private industry are usually conceived many years before their implementation, and only the physical planning that precedes them can help towards their being conceived and implemented without the usual clashes between partial plans, which have been conceived early, and general public plans which follow them at a time when commitments have already been undertaken.

To achieve the goals of this study there is a need for a special methodology allowing for the systematic selection of possible alternatives. To reach this end we have to isolate several phenomena in an order of importance, at the phase and scale at which the examination is made, and proceed by eliminating those alternatives which are the weakest in relation to the phenomena selected. This is the Isolation of Dimensions and Elimination of Alternatives Method (IDEA Method).

The application of this method makes it imperative to start with phenomena of the greatest importance. These are the ones which influence developments in macro-scales. The IDEA requires the continuous increase of the scale with greater numbers of parameters or dimensions so that phenomena of lower order can gradually be taken into consideration. This is the Continuously Increasing Dimensionality Method (CID Method).

The methodology is based on the simultaneous application of both methods of Isolation of Dimensions and Elimination of Alternatives, and Continuously Increasing Dimensionality (IDEA-CID Method), and the study is organized by phases in each of which phenomena are isolated and alternatives are eliminated in the proper scale. In every phase we proceed in two movements: in the first we make the assumption about the phenomena of

importance which have to be taken into consideration for the study of the possible alternatives and in the second we evaluate them on the basis of proper criteria in order to select the most reasonable ones. The work thus proceeds in successive phases and movements as follows: Phase A movement 1(A1), Phase A movement 2(A2), Phase B movement 1(B1), etc. The selection of phenomena, criteria and scales of every phase is based on experience about their importance.

In the 2nd phase of the whole study this method is applied in eight phases and sixteen movements, from a theoretical number of tens of millions of alternatives to some tens, a few and finally one. By necessity, as many assumptions had to be made about probable conditions and alternatives based on desirable goals, the whole system has no finality. It is only the population of UDA, and for some alternatives the administration of the countries concerned, that can take decisions, but the whole system offers the possibilities of solutions.

Models

In order to facilitate the implementation of the IDEA Method, a number of models were developed, which allowed for comparisons, as well as for the evaluation of several alternatives based on the assumptions made. Such models are sometimes very simple (as the rating models of basic functions in relation to other functions and localities) and are studied on the basis of simple calculations. Others are more complicated and require the use of computers.

The models used in this study are the following:

a. projections of urbanization trends (change of land use from agricultural to urban)

b. projections of general growth trends

c. projections of densities of habitation

d. composite projections of urbanization process

e. force-mobile model

f. accessibility models (several variations—use of computer)

g. comparison models (of the various alternatives with local conditions—use of computer)

h. transportation models (use of computer).

The Present Situation

The study of the existing conditions has proved that there are two major characteristics of the present situation of Detroit. The first is related to the geographical location of the city and its region, the second to the structure of the city itself and its area. Both of these affect the development of the Urban Detroit Area which by the year 2000 is estimated to harbour 15,000,000 people and occupy an approximate area of 23,000 sq. miles.

The Great Lakes Megalopolis which is taking shape shows that Detroit is situated in the most important location within the area which begins from Milwaukee and ends at the Appalachian Mountains. This is due to the fact that Detroit is located on the most significant crossroad of sea and land routes, on the most important site connecting USA and Canada, and in the centre of gravity of the Great Lakes area.

If more intensive development of the seaway connecting the Great Lakes with the Atlantic takes place, and if the development of the Canadian branch of the Great Lakes Megalopolis, especially of the part north of Lake Erie, is intensified, then Detroit is in the most advantageous location to act as a central urban area of this space.

The present functions and the structure of the urban area of Detroit do not correspond to the potentialities of the location. The main phenomena which justify such a statement are that Detroit is not a sufficiently developed centre of services, as should be expected from a central area of a major region, but only of industries, and physically it is not attractive as a central city. Thus its present functions and physical structure do not allow Detroit to play the role which it could because of its location.

The Present Course

Because of forces inherent in the city of Detroit, there is a certain course development which is followed by the city itself. Thus the conventional method of foreseeing and planning for the future is based on the extrapolation of present trends in an attempt to define where the present course is leading.

We have to use the method of extrapolation of the present trends as carefully as we can, but not in order to show where we should go, but only to show where we are going now and where such a trend will lead to.

On the basis of these considerations we proceeded to the estimates of extrapolation of the city growth through expansion in the future for the year

2000 by five methods, and for this purpose we either adapted existing models to the requirements of this study, or developed new ones. The five methods are the following:

a. *Projections based on urbanization trends*

In order to define these trends we based our observations on the change of land from agricultural to urban, for which very good statistics were available. This was done because the change of land between the years 1900 and 1960, for which we have data every 10 years, allows us to draw an equation of the change which we applied on the whole model of the area.

b. *Projections based on general growth trends*

The trends in the participation of each county to the total population of UDA observed from 1930 to 1964 were projected in order to estimate future population distributions by county.

c. *Projections based on residential densities*

In the same way, by extrapolating the trends in density changes observed from 1940 to 1960, in a way that takes into consideration the observed facts that lower densities near urban centers tend to increase at a higher rate than high densities, as well as the effect of saturation limits, we have obtained a picture of the new size and shape of the city in the form of isodensity contours.

d. *Projections based on population growth trends and several local factors like transportation facilities, etc.*

Special care has been paid to the study and understanding of the trends of the past, definition of their feature, and definition of saturation levels, as not all trends can continue indefinitely. As a result an estimate has been made by a method which could be called the method of "composite projections".

e. *Projections based on the accessibility model*

We are not yet sure how well this model corresponds to the phenomena themselves, especially as regards their details. Nevertheless the use of several types of accessibility models shows that in the projection of basic phenomena regarding wider areas, we can come quite close to reality.

A study of the results of the projections of the urban area to be created by the year 2000, if present trends continue, shows that Detroit, which in

1960 had a population of 3,540,000 within its urbanized area, will then have about 8,000,000. From this it is concluded that as the city of Detroit suffers from great problems in its central area and meets with very great difficulties in order to face them, it will be unreasonable to allow it to suffer more from a pressure of 4,460,000 additional people (increase by 126%).

Changing the Course

The analysis of the continuation of the present course leads to the conclusion that it is most necessary to change it. This is theoretically justified for all such urban areas, and is now specifically demonstrated for Detroit. In order to achieve this, goals must be set which can lead to an avoidance of the problems created by present unacceptable course. These goals will have to be set further in the future and will define the desires for a better urban area which will not have the weaknesses of the present one and of that towards which we are being led by following present trends. Asthese golas willbe set further in advance, in this case for the year 2000, it will be necessary to connect the point we set by the future goals with the existing situation, in order to estimate how we can move from the one to the other. It could prove for example that we desire a situation which is reasonable but not feasible for the target period of the study, or which may be unreasonable for any period. At this stage we set the goal and work backwards to check.

We proceed by foreseeing alternatives and applying the Isolation of Dimensions and Elimination of Alternatives Method, and the Continuously Increasing Dimensionality Methods (IDEA-CID).

We therefore start with the question as to how many alternatives there are about the future. We take into consideration that we want to base our alternatives on some fundamental assumptions about major urban centers, major industrial concentrations, major educational and research centers, major harbors and airports and other important functions. At the same time we must also consider different alternatives about population, densities of residence and work, systems of transportation networks, speeds of transportation, maximum travelling time, and some other parameters. We shall then have to estimate the number of alternatives that these basic assumptions create. If we present this in a theoretical metrix of possible alternatives, we find that even if we accept 10 alternatives for every one of the factors previously mentioned, we will be dealing with a total number of alternative combinations in the order of billions.

Basic Assumptions

Once this impossible and unworkable number of alternatives is reached, one has to become more specific and start the process of isolation and

elimination of alternatives. If the eleven categories of functions and the parameters referred to above, which basically influence development, are considered, and only five cases or values for each are examined, 49 million composite alternatives for the future Urban Detroit Area will have to be studied. This is still a theoretical assumption. But we have to become more specific.

This is achieved on the basis of certain basic assumptions about functions and parameters. The possible locations of major functions are reduced to nine by considering only those which are imposed by the major communication axes; and then to an even smaller number (2 to 4) by a system of rating of nodality for each of the nine locations in regard to its suitability for each one of the major functions.

As far as parameters are concerned, a medium projection (equal to 15 million people by the year 2000) has been accepted for population; the study of the most probable patterns of communication networks, in combination with various sets of speeds, led to the acceptance of eight systems of transportation with corresponding speeds, of these, three variations of maximum travelling time have been considered; finally, densities have not been included in the parameters of the problem, because it was thought that allowance should be made to examine what kind of densities will be had if the other parameters are defined, and only a ceiling to densities is given, leaving the decisions about them for future phases.

The above assumptions, ratings and eliminations led first to a matrix of 524,800 alternatives, and then to one of 11,544.

Alternatives

Progress was made by judging the force-mobile created by the relationships between locations of major functions for each of the accepted alternatives. This was done by a system of rating of groupings of functions. The 11,544 alternatives have thus been evaluated, and reduced to 312. These were further reduced to 40 by considering only the most characteristic alternatives of each category of solutions created by the same assumption concerning the force-mobile of major functions, and by considering only the most probable combinations of sets of speeds with maximum travellingtime.

The stage has now been reached at which the scale can be further increased and the impact of these assumptions on smaller units studied. For this purpose the whole area has been divided into 658 squares approximately 6×6 miles each that correspond to a great extent to the township areas. These 40 alternatives have been actually built by accessibility models, built in the

sense of the definition of the population corresponding to each such solution.

So as to further eliminate alternatives, criteria have been set evaluating them in relation to their connections with the broader space (USA-Canada and the Great Lakes Megalopolis). But also in relation to local factors like landscape (different degrees of adaptation to the landscape), availability of resources like water, and various physical characteristics like topography, etc. Furthermore, other criteria were considered, such as the maximum travelling time of man, etc. It is here especially that an opinion must be expressed as to whether and at what cost man must save many precious hours a week, otherwise wasted in commuting, or if; we desire lower densities at the expense of time. The use of such criteria leads to the selection of 10 solutions.

The 10 solutions have now to be built in an even larger scale and evaluated on the basis of other sets of criteria like transportation, cost of construction and cost of operation, adjustment to the landscape in detail (here, for example, one must consider how to preserve the small lakes which are one of the most beautiful features of Michigan). The use of such a method lead to the possible selection of three alternatives.

These alternatives are now built in an even larger scale, so that the impact can be examined not only on units of 6×6 miles, but also on very specific areas like Downtown Detroit, major shopping areas, the most beautiful spots which have to be preserved at all cost, operation of smaller communities, preservation of human values, etc. These solutions can also be worked out in more detailed budgets of construction and operation. They are also judged in detail regarding the possibility of their being implemented not only in relation to the overall target of the year 2000, but by 5-year programmes. Some may be easier to be implemented at the beginning, and some not. All these criteria can lead to one solution for this.

Conclusion

The case study here constitutes an approach and methodology for planning which tends to free itself from tastes and influence of persons or small groups and becomes a scientific approach. For our urban problems have long since gone beyond the limits of personal interpretations and abstract aesthetics. We are compelled to develop a pattern which will satisfy the needs, standards, and mechanical means of our time; but that should at the same time allow within it the preservation of human values and beauty.

The example which was examined here comes from another country. We believe that while the setting may change, the data varying, the phase

different and the place conditioned by other characteristics, there is a similarity of the problems and moreso in the scientific methodology to be applied. Examining more complicated cases, and looking ahead to phases of evolution and development that the urban centres of Pakistan may have in future, we can be in a better position to formulate solutions that will be rid of ills that others did not detect in time.

There is an evolution and a development. Let us allow ourselves to simplify their meaning by accepting as evolution the change of things by themselves, while as development the desired change brought about by man. Our cities and urban centres have evolved enough and together with them their intricacies, complications, and problems. Nobody wants to be overcome by these problems. But then we have to face them without fear. We must workout the method, the plans, and the organization tools by which to develop our cities in the future according to the pattern that will fit our needs and lives and not to allow them to grow in the chaotic nature as up to now.

Master Plans: A Sequential Approach to Urban Form in Pakistan

HUMAYUN R. SOMJEE

A plan may refer to anything from a blueprint of a small house to a set of coordinated proposals covering all aspects of the economic development of a whole nation like Pakistan.

For this reason it is necessary to use the term Master Plan to refer to a set of proposals governing the phased physical development of an area in order to bring it in line with current and future demand for urban uses. Although the term Master Plan was not made part of official usage until the New York Plan prepared by the Russel Sage Foundation made it a part of Town Planning vocabulary.

For the moment I am concerned with Master Plans as one of the three technical stages in Town Planning: Survey-Plan-Implementation; being as it is one of the topics of this conference, and also an activity in which most cities in Pakistan are or will be engaged increasingly in the near future. These three stages of Town Planning involve the activities of Town Planners from various specialized backgrounds in sociology, geography, economics, architecture, engineering and law; and any creative urbanism is the product of a pooling process between these types of Town Planners. (There being as many types of Town Planners as there are types of Engineers). In Pakistan urbanism can only be effective and positive when there is team work and coordination of types of Town Planners in the *whole* of the Town Planning process, otherwise any chance of achieving a meaningful urban form for our society is extremely thin. I have found it necessary to emphasise this particular point here, as it is critically important to us in our present stage of urbanization.

To come back specifically to Master Plans we find on examining standard practice that Master Planning on the metropolitan and legal city scale in a generation or two since the "city beautiful" movement in America has developed an established content and process through the three stages. Such a general Master Plan or Comprehensive Plan includes abstract (and usually wishful) statements of 1) Goals accompanied by maps of, 2) Land Use, 3) Highway and Transit routes, and 4) location for community facilities. This planning "process" consists of a) Goal formation, b) Survey involving research and data collection, c) Analysis, d) Synthesis,

Design and f) implementation. Unfortunately it has been found that these procedures degenerate into quick analysis, windshield surveys, quick prescriptions and no responsibility of enactment chiefly because of the dissociation of planning from city building. David Crane stated this case piognantly in this statement:

"Master Planning has in general become too abstract. In its concern with overall and long-range community goals, the master planning function has too seldom related to *physical demonstrable events*. There is no recognition that tangible development-redevelopment undertaken on an experimental basis and systematically reviewed under real-life conditions can furnish important knowledge for the Master Planning process. The planning profession gives lip service to the unending continuous nature of city planning; yet plans and community goals are still pegged for a fixed future year with very little indication of exactly how and how rapidly the required changes will be made. No one is planning for a continuous process of physical change; no one predicts or guides the rate and spatial distributions or urban constructions beyond the 6-year limit of capital budgeting for municipally-owned facilities".

It is also apparent that the Master Plan as a guide which has to be periodically updated is still not flexible and elastic as it should be. It is basically still static in concept than dynamic. It projects a frozen pattern for the future of the city, which even if completed may well become obsolete or obsolescent with the passage of time. To give an example a master plan based on special transportation modes, (and more and more plans today make the circulation system particularly auto movement as the infrastructure) may well become obsolete in the unforseeable future, should our present modes of transportation change radically. In which case our future society would find itself burdened with (if not chagrined) a useless urban form as inefficient as our present society views past solutions based on leisurely pedestrian movements, with frustration in today's auto oriented era (where speed has become a goal). Of course I may well be doing an injustice to future society in not giving sufficient credit to human ingenuity in being able to change a useless form into a meaningful one. But to leave future society to make the best of a bad bargain is to question our existence as planners here and now.

At best any Master Planning today though it may recognise the inevitability and unpredictability of change, does or is forced by tradition in town planning to come up with presentation of some sort of a final plan or "solution" for the future. Such plans are based largely on an assumed idea about the rapidity of change expected in future in various realms involved in the planning process today, even though it is difficult to predict

"to which part of a pond a stone will be thrown and which way the ripples will spread". Elements like roads, commerce, recreation, and housing today are not stable and undergo variations as new modes of dwelling and life will come to the future scene.

At worst such plans are never completed, often becoming pretty pictures to be hung in rooms of important people or exhibitions; for they have also yet to reflect the power-prediction situation in distinctly different types of proposals for the next year, the next decade, and the dimly foreseeable maximum run. On this question of power-prediction, in America today planning practice has begun to work out a policy plan idea, but it still remains to explore its possibilities at the sector scale of the city.

In view of the looming Megapolitan scale of our cities, our need today is a plan capable of adjusting to a continuous and SEQUENTIAL process of physical change; being itself a modification in a series of modifications. Of course a SEQUENTIAL process would not be a clear cut step by step progression, but that there would be a considerable playback from one step to another, as new events unfold and relate to other events; and to the extent each new step comes within the means (financially and administratively) of society.

Given a set of goals the "SEQUENTIAL PLAN" would explore, evolve and suggest a range of desirable alternatives at the different scales of the city: cluster, sector, settlement, metropolitan, and even megapolitan. Such PLANS would be expected to produce greatest benefit for facilitating growth and desired change, for specific situations at specific times. For instance such a plan would help the incoming rural migrants achieve a transition into urban life by creating areas with development potentials which increase sequentially into higher degrees of urbanity from simple groupings to a complex and sophisticated urban form depending on the degree of urbanization an area exists in at a specific time.

The SEQUENTIAL PLAN being a physical plan in the real sense would also help to provide identity and articulation to parts of the city in order to produce a legible image for the whole. (We are all tired of the formlessness and monotony of our urban areas where recognition of an area becomes a search for a scheme number or a chaurangi number showing our failure to govern multiplicity creatively, and humanise numbers by articulation). Articulation might perform multiple duty. It underlies the "city symbolic" called for by Crane. It makes possible Serge Chermayeff and Christopher Alexanders community of privacy, and if it also articulates CONTINUITY, it may achieve Fumihiko Maki's "Group Form".

The" SEQUENTIAL PLAN" would free itself from conventional formal two-dimensional patterns of city organization. The orthagonal or rectilinear plan; the radio-concentric plan; the curvilinear plan; and the linear or spinal plan, though having served significantly in the history of town planning; and still useful to the town planner today as a part "of his professional stock in trade", are not necsarily the only form givers of the city. The town Planner must today achieve new open SEQUENTIAL non-hierarchic forms based on growth, related to land forms, and responsive to the indeterminacy and pluralism in our cities.

Examples of organising the city on a sequential form can be seen on looking at the history of town planning, where one can see examples of city growth in a sequential form over a considerable span of time. But cities today are growing as they have never grown before. It can be shown that eventually 70 to 90% of the population of the future will be urbanised in cities extending hundreds of miles with a population count in tens of millions! With this view in mind new approaches have to be evolved, along with careful extrapolation of what is useful from the morphological analysii of past cities, and present techniques. (Herein also lies a challenge to our engineers for considering the problem of sewerage, water surply, smog, transportation for the city of tens of millions.)

A very important phenomenon, and I believe almost never considered in Master Planning today, is the realisation of the city as a continuous series of three dimensional forms in space: The physical and perceived city; or as Joseph Hudnut has termed, the visible city which is shaped by the invisible city, pattern of law, technology, and economic necessity; human hopes, fears and aspirations. The potentials for making the city form visually satisfying and urban life delightful though enormous are completely left to accident.

Although the usual Land Use plan which deals with abstraction and location of the amount of land to be used for various purposes implies broadly the physical form of the activities through zoning and density controls, its essential character remains two-dimensional and crude. In so far as Land Use plans make possible decisions on major issues in an efficient abstract method, particularly at a scale where the horizontal dimensions are too vast to achieve any meaningful relationship with the veritcal scale of the city, it may be considered a highly important and basic step in the Master Plan. But too often its implications for creating physical and powerful urban form remain unexploited because of the tendency of thinking Land Use in terms of purely a real, two-dimensional designation on paper and forgetting the city as an urban scene overflowing with very real three-dimensional forms, and lights, colours, sounds, and movements;

whose impact on the city dweller can be either soul satisfying or soul destroying.

Of course this is not because of any conscious disregard in the Master Plan for form, but largely because at present there is as pointed out by Maki a *lack of an adequate spatial language of urban form to organise our cities.* Our present concept for Town Planning are not entirely capable of equipping us satisfactorily in the shaping of our new urban environment. This need becomes more urgent if we are to approach the design of our urban areas in an open sequential form.

Let me make my position about urban form clear. I am not propagating a "city beautiful" movement or championing "face lifting programs". Nor am I advocating fountains in traffic islands where they have no business to be! *If anything else I am speaking against such city gimmickry.* I do not speak of form here as some sweetmeats to be turned out from the planning kitchen as "inspiration" takes us; in which case there would be no point in talking any further about it.

I speak of large scale city form here as having a *raison d'etre* in our society, which will help put the urbanised individual and his environment into harmony and reconcile him to the new scale. Such a form in the light of stated Goals for the Sequential Planning process will express in physical and felt terms the pattern of diverse activities in the city, and give special meaning to change in activity, place of gathering, moving from one destination to another; and a million other urban activities whose expression is a challenge to us (and a worthy challenge indeed).

Form here will be a crystallisation in the constructional plane of the "SEQUENTIAL PLAN" born from a more deeply understood purpose with the emphasis on "more deeply".

The sequential plan has particular meaning in the making of *urban renewal and redevelopment plans for our cities.* It is a reality to assume that renewal will be made on a piece-meal incremental basis particularly where government activity will be limited to laying the outline or framework on which private development will take place.

In making Master Plans for renewal of parts of our cities we cannot overlook the fact that in view of the variability in the elements of the city, to establish total forms and rigid volumetric controls would be disastrous, as such spatial relationships as might be desired *now* among the structures would be completely arbitrary, limiting the possibility of CHOICE AND CHANGE. The SEQUENTIAL PLAN here in this sphere would therefore

act as the generator of renewal so that future developments would be based, not on a preconceived form in today's space-time relationships but on a concept of sequential form affording within its framework plenty of opportunity of finding expression in the space-time relationships of tomorrow.

Finally I would like to add that we must try and understand the people of our cities more. Who they are, what they want, and where they are interested in going, at the same time realising that we cannot discover their needs by only asking. We must also try and make them understand us, and to make them interested in the future of Pakistani cities ; an interest particularly thinned by the obvious fact that for most city dwellers today, future programs years hence lack immediate appeal. "You cannot want to miss what you cannot see, and when someone tells you that it will not show up for 10 or 20 years, forget it."

Let us therefore make Master Plans for our cities, only let us approach them *carefully*, *realistically*, and *sequentially*, with *determination*, *foresight* and *teamwork* to create cities which will fulfil the requirements and aspirations of those who will and are living in them. Plans which will show the means to an end rather than end themselves as "*one shot reports*".

Master Plan for Greater Lahore

ANIS-UR-RAHMAN

PROLOGUE

The Second Five Year Plan (1961-65) envisaged the preparation of Master Plans of eleven important cities in West Pakistan. Lahore being the Provincial capital topped the list. The Provincial Government realising that neither the Lahore Municipal Corporation nor the Lahore Improvement Trust was equipped for this job, undertook the preparation of its Master Plan.

A Master Plan Committee was set up under the Chairmanship of the Commissioner, Lahore Division, in February, 1961. The Committee comprised the following members :

a. Chairman, Lahore Improvement Trust.
b. Chairman, Lahore Municipal Corporation.
c. Joint Secretary and Adviser, Town Planning & Housing, Communications and Works Department, Lahore.
d. Chief Engineer, Public Health Engineering Department.
e. Chief Engineer, B & R Central Region, Lahore.
f. Director of Industries, West Pakistan, Lahore.
g. Town Planner, Lahore Improvement Trust.
h. Director Town Planning, Lahore Region, Lahore.
i. An Army Representative.
j. Deputy Director, Master Plan Project, Lahore (Secretary).

The Committee held 25 meetings and discussed various issues, problems, and policy matters in connection with the preparation of Master Plan. Nature and volume of work involved in the preparation of Master Plan is indicated in Appendix 'A' of the interim report on the Master Plan for Greater Lahore which was published by the Committee in 1962. The work was divided into four distinct stages; namely, the survey of existing conditions and resources, future projections, formulation of planning standards and planning proposals.

The Master Plan document was divided into two parts. Part I is analytical and deals with the existing conditions and problems; whereas Part II comprises proposed planning standards and recommendations. Part II was subdivided into three sections. Section one deals with the land-use planning and zoning, section two with the implementation and administration of the Plan, and section three with the zoning and subdivision regulations.

The focus of this paper is the conceptual framework and the policy for urban development as envisaged in the Master Plan for Greater Lahore. As such, surveys and their analysis, planning standards and the zoning and subdivision regulations being outside its purview have not been discussed. The paper shall, however, attempt at a brief description of salient land-use proposals which would facilitate a better understanding of the conceptual framework provided by the Master Plan for Greater Lahore.

Need and the Rationale

Important cities like Lahore have been extremely dynamic in their physical as well as functional growth but have usually developed in a piecemeal fashion by the accretion of many individual sub-divisions and buildings independently conceived with little or no coordination. This has resulted in the intermixture of incompatible land-uses, traffic hazards, lack of community facilities and services and haphazard growth. If harmony and order are to be achieved amid this evolution, there must be a Master Plan, such a Plan should provide a means of coordinating new development and ensure that the essential facilities and services are adequately provided to cater for the present and future needs. This will rectify many mistakes of the past and promote orderly development adapted to the needs of the future and so improve the economic base of the urban area. With the advancement of modern city planning techniques, preparation of Master Plan is getting greater and greater recognition and emphasis, and cities are getting more and more conscious of their problems and are trying to solve them in a coordinated and scientific way.

Studying the past trends of growth of Lahore, it is clear that Lahore is a fast growing town and that its development cannot be brought to a standstill. The pressure exercised by the immigrants, the absence of any marked physical and political barriers except the River Ravi and the Indian border both at some distance from the city, have manifested themselves in haphazard and lop-sided development. For instance, Lahore has grown upto 7 miles along Kasur Road, Jail Road and Wagah Road and only to mile 3 along Multan Road. The problems, therefore, should be to guide the growth of the town on proper lines and to decide

about the rate of growth of Lahore in relation to its economic development rather to fix its optimum size. This will guard against over urbanization of Lahore in relation to its socio-economic resources and could only be accomplished through the decentralisation of industries. Decentralisation of industries is an extremely intricate and involved issue and needs definite policy decisions.

The question what is the optimum size of a town, is one of the many questions in planning to which there is no definite answer and the conclusion must be governed by practical considerations of each specific town. The size of the town is in fact a relative concept and could be increased by boosting up the efficiency of public transportation system and providing adequate community facilities and services. However it should not be taken to mean that Lahore should grow to an unlimited size as there are limitations on the speed and efficiency of public and private transportation system, the capacity of the traffic arteries, social and public services, availability of physical resources and the rate of economic development. Assuming that an average speed of 15-25 miles per hour could be maintained on the main traffic arteries, a radius of 6-7 miles seems to be quite convenient and well within human scale. This would mean that the centre of the town could be reached within 15-30 minutes from the periphery of the town. It may again be emphasized that for the development of a town, what is more important is its economically balanced, well planned and healthy growth and not its optimum size.

Comprehensive, balanced and overall programme for physical development of Lahore can be brought about only if the entire Urban Region of Lahore is considered and planned as one composite unit. The Master Plan is in fact the translation of planning policies and principles into physical form as a proper city development plan has a powerful influence on the physical, mental and moral development of people. It is a firm basis for building a healthy and wholesome community. It may, however, be pointed out that the Master Plan is not a blue print, but a general design and as such it only provides the broad and general direction for development. Such a general guide is an essential first-step, to be followed immediately by a number of more specific plans. The Plan must be reviewed every 5-7 years to adjust its sights to the new times and the changed conditions. Although it must be firm enough to serve as a guide on which people can rely, it must not be rigid and incapable of being adapted to the changing conditions. At the same time a realistic plan looks only to the predictable future, a relatively short time in this dynamic age, possibly twenty years.

Major Planning Policies and Decisions

The problem of over-congestion and over-urbanization in relation to the economic development is proposed to be tackled simultaneously at

two levels namely, regional and local. At the regional level immediate action is required to stop and detract the ever increasing tendencies of rural urban shifts of population. The influx of people could either be diverted to the existing peripheral towns by strengthening their economic base or by the creation of self sustaining new industrial townships around Lahore. Action at the local level is necessary for the renovation of community facilities and services, enhancing the efficiency of public transport system in order to reduce the time spent in journey to work, provision of subsidised low cost housing at suitable places to relieve the over congestion and decentralization of places of employment to minimise the friction offered by long distances.

Urban Lahore has, therefore, been conceived as the core of large metropolitan complex comprising of a system of self-sufficient communities around it with regulatory measures in the intermediate green belt.

Lahore will continue to be the seat of the Provincial Government.

In order to preserve the cultural heritage, educational and garden city character of Lahore, the location of large and strategic type of industries in Lahore should be discouraged. Service and medium industry may, however, be permitted to grow to further stabilise the economic base.

Lahore will continue to be the major financial, business, commercial and distribution centre. The diversified economic base will result in the proportionate increase in the percentage of labour force in the respective categories, provided the rural-urban shift is controlled.

It will not be possible to undertake large scale redevelopment of residential areas like the Walled City and Mozang during the Master Plan period due to the acute housing shortage and lack of financial resources. A conservative civic surgery aiming at gradual improvement of community facilities and services in the residential redevelopment areas appears to be the only feasible solution. However, redevelopment areas zoned for commercial use should be subjected to liberal urban renewal operations so as to increase the intensity of use.

The Land Use Plan

The Land Use Plan for Greater Lahore has two distinct levels, namely: (*i*) the urban region and (*ii*) urban Lahore. The former comprises of green-belt and the satellite towns whereas the latter deals with the planning proposals regarding urban Lahore. Salient features of the Land Use Plan will be discussed in the following paragraphs:

a. *Green Belt*

The proposed green belt around urban Lahore extends from the eventual limits of urban Lahore to about 15 miles on the Northern, Western and Southern sides. In the east, the depth of the green belt is reduced to 5 miles due to the nearness of the Indian border. The total area under green belt is 908 square miles. The green belt apart from checking unwieldy urban sprawl and the tendencies of ribbon development, will also cater to the vegetable, dairy and poultry needs of urban Lahore.

. b. *Satellite Towns*

The towns of Muridke, Sheikhupura, Raiwind, Lulliani and to some extent Pattoki lying outside the green belt, have been selected to be developed into satellite towns with their own independent economic base. These towns possess a sufficient potential of becoming medium sized towns of population ranging between 25,000—100,000 persons. If properly planned, and developed these urban areas would provide employment opportunities for the distressed migrants from rural areas whose unchecked movement to the Provincial Metropolis is taking alarming proportions and upsetting its already hard pressed social and public services. Population of these urban centres according to 1961 census is given below:

Muridke	..	6,757
Sheikhupura	..	41,635
Pattoki	..	11,903
Lulliani	..	11,988
Raiwind	..	7,621

Of these, Sheikhupura being a district headquarter can grow as a satellite town of 100,000; Muridke and Pattoki of 50,000 each with industry as a predominant economic base and Lulliani and Raiwind of 25,000 each as "Mandi" towns and service centres. In fact, uncontrolled industrial activity has already started along the National Highway near Muridke. The chaos created by industrial ribbon development would attain gigantic dimensions, if immediate regulative measures are not adopted. The National Highway has already lost its character and needs to be bye-passed. The development of industrial housing across the Highway would further downgrade the character of the Highway into a pedestrian Mall. The impetus provided by the existing industrial nucleus and the anticipated pressure of new industrial estate proposed to be constructed in the area, call for a coordinated land use development which is not possible unless the preparation of Outline Development Plan is taken up immediately.

These towns are expected to exist as independent entities but in a definite subordinate position to Lahore. Growth of the Provincial Metropolis will, therefore, provide an additional impetus for these towns and as such they will need strong land-use control measures, otherwise, these urban centres will degenerate into slums. Propagation of slum conditions in these satellites of Lahore would result in an accelerated pace of distressed migrants to Lahore which would not only increase the rate of slum formation in Lahore but would also overburden its economic resources. It is, therefore, highly imperative that the Provincial Town Planning Department undertakes the preparation of Outline Development Plans of these urban settlements at the very earliest.

Lahore, alongwith other towns like Sialkot, Gujranwala, Okara, Montgomery and Lyallpur form the urban core of West Pakistan. The September, 1965 war experience is, however, expected to stem the development of basic industries in Lahore and also calls for the dispersal of substantial railway works to other areas. Nevertheless, Lahore would continue as an administrative city with service industries and a centre of culture and learning and would continue to grow. With the increase in population and more rapid mechanization of farming, the pull being exercised by Lahore on its vast hinter-land would increase manifold. In view of this the establishment of new industrial satellites on the west side of River Ravi on less productive agricultural land appears to be highly desirable. Site for such industrial satellites are suggested at Kamoke, near Pattoki, east of Sheikhupura and near Nankana Sahib. However, detailed regional planning surveys and studies would be necessary for the selection of the specific sites for the new towns. It is, therefore, proposed that the Provincial Government should take immediate steps for undertaking a regional study of the urban core of West Pakistan in order to assess the complex inter-relationship of various urban centres and to suggest specific locations for the various hierarchies of service and industrial centres alongwith the connecting communication system.

c. *Urban Lahore*

Lahore has been divided into six planning divisions, namely; Central Area Division, New University Division, Kot Lakhpat Division, Amar Sidhu Division, Cantonment Division and Baghbanpura Division. The population of the planning divisions vary from 4 to 6 lakhs, depending on their size and the proposed density. A Planning division has been visualised as a self-sufficient unit having its own industry, commerce, offices and other public and semi-public uses. Each division[1] has been provided

1. The only exception to this is the Central Area Planning Division which mostly comprises of mixed central area and public uses. In this division the various divisional, district, and neighbourhood functions exist side by side in a diffused form.

with a "Divisional Centre" which would cater to the divisional level functions. Each division has further been divided into planning districts of about 1,00,000 population and provided with a "District Centre". The District Centre will cater to the educational commercial, recreational and other needs of the residential areas. Each district has further been sub-divided into neighbourhoods having a population of 25,000. Neighbourhoods have been provided with "Neighbourhood Centres" which would cater to the lower order functions and other incidental needs of the residents. Neighbourhoods have further been proposed to be sub-divided into mohallahs of 6000 each with " Mohallah Centres ".

Central Area Division due to its high employment potential and job opportunities for service workers, has attracted a large number of squatters. These persons being mostly engaged in petty service jobs cannot afford the daily travelling expenses and, therefore, have a tendency to reside close to their places of work. This has resulted in the development of " Juggies" clusters in and around the Central Area Division. However, the Survey of Shelterless People in Lahore in 1962 revealed that even skilled workers, stenographers, assistant station masters, clerks etc. are living in "Juggies" due to the acute housing shortage. Due to high land values in the central area it is not possible to accommodate the substantially high number of "Juggi" dwellers. With the provision of cheap transportation facilities, Lahore Township Scheme is expected to relieve the housing shortage of the industrial and other ministerial workers living in "juggies" and in the central area to some extent. However it is considered imperative that low cost housing schemes should be prepared in several fairly distributed locations in the Central Area Division and in the planning divisions adjacent, thereto.

Proposals for the Cantonment Planning Division have not been formulated as the Cantonment is administered directly by the Ministry of Defence and is outside the purview of the Provincial Government. Nevertheless, it is suggested that army authorities should get an overall development scheme prepared with adequate provisions for community facilities, services and other higher order functions. The present trend of subdividing the big residential plots on piece-meal basis would result in acute shortage of community facilities and services in the Cantonment.

With the exception of land sub-divided by the Lahore Improvement Trust the state of affairs of sub-division planning in Lahore has been most unsatisfactory and calls for immediate remedial steps. A number of unauthorised housing societies are operating in Lahore urban area which have been sub-dividing land haphazardly without any regard to the planning principles. These societies have been selling the sub-divided land for residential purposes without even providing the basic amenities and services.

These societies are responsible for sub-standard housing and formation of vast slum areas. Nevertheless, they have a thriving business due to the acute shortage of housing units. The societies have their regular offices and have even been advertising in the press for the sale of plots despite the fact that the schemes are not approved by the Corporation as required by Section 75 of the Municipal Administration Ordinance, 1960. Sale of such sub-divided plots is illegal and should be stopped forthwith. However, there are a great many discouragements and bottlenecks in the way of real estate developer for getting his land sub-divided. The difficulties are procedural as well as technical.

At present, a private developer has to apply to the Lahore Corporation for the preparation of Site Development Scheme under Section 75 of the Municipal Administration Ordinance, 1960. The Corporation then sends the case to the Lahore Improvement Trust for preparing the scheme. The preparation of site development schemes is only one of the secondary functions of the Lahore Improvement Trust; the primary function being the preparation of development and redevelopment schemes. The Town Planning Department of the Lahore Improvement Trust with a minimum technical staff is already over-worked due to the huge developmental programme. Consequently, the prospective developer has to wait, sometime for years. Even after the scheme has been prepared by the Trust, it has to undergo a score of formalities before it can be finally sanctioned. The delays of 4-10 years are not very uncommon with the result that by the time the site development scheme is finally sanctioned, it becomes impracticable due to the haphazard and mushroom growth which has already taken place on the major portion of the site. As the preparation of site development schemes is one of the mandatory functions of the Lahore Corporation, it is imperative that a Town Planning Department is set up in the Lahore Corporation affording an expeditious preparation of site development schemes. At the same time, the Town Planning Department of Lahore Improvement Trust should be greatly strengthened so as to enable it to undertake redevelopment of the central and slum areas.

Implementation and Administration

a. *Programming and Phasing*

Programming and phasing has many advantages. It aims at a balanced and coordinated development programme; provides a yardstick for development against which one could check the rate and extent of development; aims at the optimum utilisation of capital; ensures maximum benefits to the people; resists the premature development and promotes the development of complimentary land-uses.

The development programme has been phased over three, five year periods which would run concurrently, with Pakistan's Third, Fourth

and Fifth Plan Periods, namely 1965-70 ; 1970-75 and 1975-80. Many factors influence the order in which different portions should be developed. Among the more important are the tendencies of people and the major direction of growth, accessibility and extensions of utilities, availability, of community facilities and completion of major services.

b. *Financial Aspects*

Although it is not possible to work out the extent of financial involvement of the development programme during the 1965-81 period due to the spiralling land values and rising cost of materials and equipment however certain policy decisions appear to be highly desirable. These decisions would not only go a long way in reducing the cost of development but would also enable the city to achieve certain target which otherwise appear to be beyond the economic means of the Municipal, Provincial and even the Central Government. It is also imperative that further deterioration of the standards for higher order civic functions should be arrested before it becomes too late. Some suggestions are put forth in the following paragraphs with a view to accelerate the pace of land use development and and ensure optimum utilisation of resources.

To exercise a better control on land use development and to check the spiralling trend of land values, it is highly desirable that the Government should promulgate progressive urban land policies. In fact, agrarian reforms, coupled with rural-urban shift have already had appreciable impact on land values. Among other things, which should be considered are:

(*i*) Limiting the urban land holdings.

(*ii*) Allotment by Government of residential sites on lease-hold basis rather than free-hold basis.

(*iii*) Levying an advalorem tax on the value of land and imposing development or betterment or conversion charges.[1]

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[1] The term "Development Charges', "Betterment Charges" and "Conversion Charges" have been defined differently in various Town Planning and Land Acquisition Acts and. occasionally the first two terms have been used interchangeably The. terms have been used to mean the following :

a. Development charges are capital charges to be recovered from the owner whose land or property has been developed as a result of an improvement or development scheme in the area. Such land or property will lie within the boundaries of the schemes.

b. Betterment charges are usually imposed on land whose market value is substantially increased as a result of the execution of an improvement or development scheme on adjoining land. Such land will lie outside the boundaries of the scheme. Realization of betterment charges, however, is an extremely involved affair and has many administrative and legal complications.

c. Conversion charges are levied for carrying out any development or the institution or change of use of land for which permission may be required according to the zoning Map or the Master Plan. The conversion may fall in any of the following categories :

(*i*) From agricultural land-use to residential or industrial or commercial land-use.

(*ii*) From residential land-use to industrial or commercial land-use.

(*iii*) From a less intensive use to a more intensive use within the same category.

(*iv*) Authorising the Improvement Trusts, and other civic bodies to acquire land or declare their intention to acquire land for development schemes and other allied public purposes in advance of framing detailed schemes so that land speculation is stopped.

It is imperative that the public and semi-public authorities even though developing a small piece of land should always keep the overall picture in view. Small developments should be considered as phases of an overall integrated scheme, rather than piecemeal and uncoordinated developments. In the case of site development schemes of the private developers, a levy should be imposed to recover the prorata expenditure of the higher order community facilities which have to be supported by more than one scheme. This levy can be realised as a part of development charges or like arrears of land revenues. Unless, positive steps are taken towards safeguarding the provision of higher order civic functions, it is feared that standards of community facilities and services will go on deteriorating with the growth of population.

The Lahore Corporation should impose a development cess for meeting the cost of higher order civic functions like metropolitan parks and forest areas, green belts, hospitals, colleges, community halls and auditoriums etc.

Research towards the development of cheap building materials would substantially bring down the cost of construction.

Standardization and prefabrication of building materials and components with emphasis on modular coordination of dimensions would greatly help the industrialization of building construction process.

c. *Administration of the Plan*

The agencies at present engaged in Planning and Developmental activities in Lahore include among others, the Lahore Improvement Trust, the Lahore Municipal Corporation, the Cantonment Board, the Model Town Cooperative Society, and the Provincial Government. These agencies having overlapping powers, operate independently, each catering for its own requirements and needs in its respective sphere of activity. The Lahore Improvement Trust and the Provincial Government exercise their control only within the boundaries of their schemes, whereas, the Lahore Municipal Corporation is operative within the Corporation limits excluding the areas already being administered by either of the two aforesaid agencies. The Cantonment Board operates within the Cantonment boundaries under an entirely different set of statutes. Likewise, the Model Town Cooperative Society functions under its own rules and regulations in the

Society area. This has resulted in a chaotic situation and lack of coordination and overall control. Under the circumstances it is highly desirable that there should be one Planning Authority in Lahore which should formulate closely knit planning policies; control, regulate and guide the development programme of various agencies engaged in land-use development and administer the implementation of the Master Plan for Greater Lahore.

Keeping in view the proposed functions and responsibilities of the Planning Authority it might be inferred that the possible choice can be made out of only two agencies, *i.e.* the Lahore Improvement Trust and the Lahore Municipal Corporation, who play a major role in the planning and development of the urban area. However, it is feared that either of these two organisations may be able to provide the overall coordination without an adequate representation from the various other bodies which are also engaged in planning and developmental activities in Lahore. It is, therefore, proposed that a "Planning Authority" should be constituted under the Chairmanship of the Commissioner, Lahore Division with following officers who represent the various development authorities operating in the Greater Lahore area, as its members:

(*i*) Chairman, Lahore Improvement Trust.

(*ii*) Chairman, Lahore Municipal Corporation.

(*iii*) Executive Officer, Lahore Cantonment Board.

(*iv*) Town Planner, Lahore Improvement Trust.

(*v*) Representative of the Town Planning Department, (To be nominated by the Government).

(*vi*) Chairmen of such recognised semi-autonomous societies as may be deemed fit by the Government *e.g.* the Model Town Cooperative Society.

(*vii*) Chairmen of the concerned District Councils.

The Planning Authority will provide overall guidance on land-use development and other related planning matters within the broader framework provided the Lahore Master Plan. The powers to grant relaxations regarding the provisions of the Master Plan shall, however, vest with the Provincial Government. Implementation of the planning proposals contained in the Master Plan for Greater Lahore will be the exclusive duty of the various development authorities whose work would be Coordinated by the Planning Authority.

The Town Planner, Lahore Improvement Trust will act as Secretary and the Lahore Improvement Trust as the Secretariat of the Planning Authority. It is recommended that the Town Planning Department of the Lahore Improvement Trust should be further strengthened to cope with the additional responsibility of maintaining an upto-date record of the planning proposals, development/redevelopment schemes submitted by various agencies and planning sanctions accorded by the Planning Authority from time to time.

d. *Legislation*

At present, there is no effective legal power for the implementation of Master Plans. Without such a statutory cover, Master Plans would be of little practical value. The existing statutory powers emanate from the Punjab Town Improvement Act, 1922 and Municipal Administration Ordinance of 1960. The Town Improvement Act provides for the control of development only in the areas where the Trust schemes are operative and the Municipal Administration Ordinance for the preparation of Master Plans of only the Municipal areas and the preparation of site development schemes where such Master Plans have been prepared and sanctioned. The existing legislation, however, does not provide for the control of development during interim period, extent and level of Master Plans procedure for their sanction and implementation.

The Town Planning Department has, therefore, drafted an Act to provide for the regulation and planning of the use of land in towns of West Pakistan. The draft which has been approved by the Council of Ministers in principle is being vetted by the Law Department. The Act, which is likely to be available in due course, would provide the desired legal cover for the implementation of the Master Plan. It is further suggested that the Act may further be got vetted from the Ministry of Defence, so that it may also provide the requisite legal cover for the Cantonment Board.

Epilogue

At this stage, it appears most pertinent to cast a bird's eye view on the problems of urbanization at the National and Provincial levels. The change over from agrarian economy to industrial economy in Pakistan has accelerated the process of urbanization which brings in its wake many problems with far reaching implications. Granted that big cities like Karachi and Lahore have involved and intricate problems which need to be tackled on priority basis, but these cities are not growing in isolation and have a far reaching impact on other urban centres which are either situated within their urban region or connected through functional inter-linkages. For instance Karachi represents an urban region rather than an urban centre. In order to achieve a balanced and a coordinated inter-

action of various urban centres, it is imperative that the problem is examined in a much wider perspective and major policy decisions taken regarding the location and relocation of industries, service centres, transportation network and if necessary, the establishment of new towns. Urban Development Plans should then be prepared within the broad framework provided by the Regional Development Plans.

The element of comprehensiveness in a Master Plan is a matter of degree which has a direct bearing on the availability of financial and technical resources and the nature and magnitude of the problem. Preparation of a proper Master Plan based on detailed surveys and backgound studies is a big undertaking and requires considerable time, money and experience. It is inappropriate that while the bulk of our urban centres are growing haphazardly, we should be concentrating our limited resources for the preparation of detailed Master Plans for only a few ubran centres. According to the 1961 census, there were 76 urban centres in the country which had a population of more than 25,000. All these 76 urban centres need Development Plans before their problems become too acute to be tackled economically. It is therefore suggested that first series of Development Plans for these urban centres should be in fact Outline Development Plans based on a survey of predominant Land-uses and should create a physical infra-structure for the subsequent Development Plans, establish institutions through which the Plans can be implemented most effectively and should provide a conceptional framework for future development. Second and subsequent series of Master Plans should, however, be more detailed in nature.

It is a matter of great satisfaction that Pakistan's Third Five Year Plan provides for the preparation of 5 Regional Development Plans, 45 Outline Development Plans and 23 Master Plans in addition to the enactment of appropriate legislation on physical planning and housing. Third Plan also suggests the establishment of independent departments in both the provinces.

Target set out by the Third Plan go a long way in stemming the tide of over-urbanization in relation to the socio-economic resources of the country and bringing about the much desired coordination between various public and private agencies involved in the process of urbanization. However with the existing slim set up of Town Planning Organization, it is not possible to fulfil the Third Plan target which are very modest when viewed against the ever increasing chaos in the urban areas. It is, therefore, suggested that a full fledged Ministry of Physical Planning & Housing at the Centre and independent Departments at the Provincial levels should be established without further delay. It is further suggested that high

level Urban Development Councils should be constituted at the Central and Provincial levels which should be responsible for laying down policies for urban development and coordinating the work of various departments participating directly .or indirectly in the process of physical development. It is worth mentioning that such a Council has already been constituted in East Pakistan under the Chairmanship of Additional Chief Secretary with the administrative secretaries of all the principal deparments as its members. This is a very healthy achievement as what really matters in the process of physical development is that the policy decisions should come from the highest level so that they become obligatory on various public and private agencies.

Master Plan of Islamabad Metropolitan Area

SULTANA FARHAT HUSSAIN

INTRODUCTION

When Pakistan achieved its independence in 1947 it lacked a capital. This drawback has been a blessing in disguise. It has provided an opportunity to shape a national headquarters which would not only be a showplace but also a symbol of strength, culture and tradition. A city which is not merely a response to the chance and change of times but one which challenges man's capacity to create and to contrive for an eventual triumph maintaining a just balance. Islamabad, the new capital of Pakistan, is thus springing up as a city predominantly of today and tomorrow and in this way is different from the cities which are over-shadowed by the past. It is hoped that this city would be impressive, attractive and inspirational.

BASIS OF THE PLAN

In September 1959, the Federal Capital Commission was established to prepare a Master Plan and programme for Islamabad. This commission appointed 14 committiees of 100 experts drawn from 46 specialized departments of the Government. Their studies, surveys and investigations form the basis for the selection of the site. The Master Plan for the Metropolitan Area of Islamabad has been prepared by Doxiadis Associates. This plan has been prepared on the principle of "dynapolis" which means a city with the potentials of dynamic development. The plan has also incorporated the principles of unity of purpose, hierarchy of functions and dimensions of time. Details of each are as follows :

1. *Dynapolis*

In general, cities of the past grew around the king's or chieftain's residence or were planned so that the business and commercial part formed the heart of the city and other functions like residence, administration and industry formed rings around it. After development had gone on for a couple of decades, the centre became almost choked and thus, its future expansion became difficult. On the other hand, in Islamabad, the dynamic city or the expanding city, instead of the traditional concentric belts, varous functions form parallel belts. Thus, each function of the city can develop freely and naturally along a planned and pre-determined course.

2. *Unity of purpose*

The Master Plan of Islamabad has been prepared in such a manner that it includes all social, all income groups and all types of functions. The plan has tried to provide equal opportunities to all its inhabitants. In other words, economic, social, political, aesthetic and cultural requirements of the citizens have been taken into consideration so that varying types of buildings and houses as well as varying types of facilities, depending on the profession and income of the users, have been provided.

3. *Hierarchy of Functions*

Normally residences, shops, schools and factories grow up in a haphazard manner with the result that considerable time ad expenditure are involved in going from residence to office or to shops or to schools and other places. In Islamabad various community facilities are graded according to the size of population and are so located that threre is economy in every respect. Planning has been done with a view to meet the physical, intellectual, emotional and spiritual needs of the inhabitants.

4. *Time Dimension*

Cities of the past were built only for human beings. In Islamabad planning has catered to the requirements of men and machines. Provision has been made for air age as well as space age, and in this way the requirements of today and of the future have been kept in view.

MASTER PLAN

Four highways, with a right of way of 1,200 feet, form the framework within which a grid of squares has been developed. Two of these highways namely "Islamabad Highway" and "Murree Highway" link Islamabad with the rest of the country. Traffic for Islamabad coming along the Grand Trunk Road or the National Highway would switch over to the Islamabad Highway at a distance of about 10 miles—south-east of Rawalpindi and that way avoid going through its congested traffic. This Highway between "ZERO" Point and Gumrah Bridge is already being used and its link with the Grand Trunk Road is expected to be complete by the end of this year. Traffic coming form Afghanistan, Torkham and Peshawar side would come along the Grand Trunk Road up to the Coca-Cola Factory which is at a distance of 7 miles—north-west of Rawalpindi. From here the traffic would move on the Murree Highway and thus, would be able to bye-pass the almost choked streets of Rawalpindi. This highway has already been completed and is open to traffic.

The area enclosed by the Master Plan can be divided into three parts:

1. Rawalpindi.
2. National Park.
3. Islamabad.

To the south of the Murree Highway and west of the Islamabad Highway is the Rawalpindi area; to the south of Murree Highway and east of Islamabad Highway is the Islamabad Semi-Urban Area or the National Park; while to the north is Islamabad proper or the urban area.

1. *Rawalpindi area*

In this portion of the Master Plan, which is 1,625 feet above sea level and covers approximately 119 square miles, are the Rawalpindi City, Rawalpindi and Chaklala Cantonments and the area reserved for the future expansion of Rawalpindi. Rawalpindi is the regional centre and will continue this function even in the future. It also includes the green belt (south of the Murree Highway) which forms the dividing belt between Rawalpindi and Islamabad. To the south of this belt are the special institutions which include the Rawalpindi Polytechnic, Postal Training Centre, Colleges for girls and boys, Youth Hostel, Girls Guide and Boy Scout sites, Islamic Research Institute and other similar institutions which would serve both Rawalpindi and Islamabad. To the south of these areas the industries and communication centre. The main railway station and bus station are located in this area. Besides, there are industries which would largely serve this region. The international airport is also located here. Passengers from Islamabad would reach the terminal via Islamabad Highway and those from Rawalpindi would have to drive on Murree Road and then on Lehtrar Road or the Highway.

2. *Islamabad Semi-Urban area or the National Park area*

The National Park or the Islamabad Semi-Urban area, measuring about 187 square miles, is reserved for cultural, educational and scientific institutions. The Atomic Research Institute which is located in the eastern corner has already started functioning. Similarly the first phase of the National Centre has been completed. This consists of the laboratories, residential houses, administrative wing and training institute. The complete project includes 500 beds hospital and the Medical College.

A considerable portion of the National Park area is reserved for poultry, vegetable and dairy farming. This will enable the citizens of Rawalpindi and Islamabad to get the perishable commodities from a distance of only 8 to 10 miles.

Along the Islamabad Highway is the exhibition area where agricultural and industrial exhibitions would be planned and to its north is the zoo, aquarium and botanical gardens' area.

In the corner formed by the Islamabad Highway and the Murree Highway is the National Sports Centre or the Islamabad Park. The golf course

of Islamabad and the Eidgah for the entire city are located in this park. Places have been reserved for the children's park, the national stadium and various games including cricket, hockey, foot-ball and tennis. The Shakarparian Hill, which has become a popular garden, is very significant because in a meeting which was held in 1959 the Cabinet took the final decision that the Capital should be located in this area. The Rawal Lake, which is another popular tourist area, is to the east of the Islamabad Park. This lake will meet the water requirements of greater Rawalpindi and would also provide water for irrigation in the National Park area. Water from this lake cannot be utilized for Islamabad because the level of the lake is at least 200 feet lower than that of Islamabad.

3. *Islamabad Proper*

Between Islamabad Highway and the Margalla Hills is the city of Islamabad. It covers an area of 133 square miles which is an undulated plateau with a height ranging from 1,700 to 2,000 feet above sea level. As has been mentioned earlier, various zones have been planned in parallel belts and details of each are as follows:

a. *i) Administrative Sector*

The very function for which Islamabad came into existence, that is to serve as the seat of the Central Government, would be carried out in the Administrative Sector. Its continuation on the northern side along the foot-hills is reserved for future expansion. This Sector is located at the eastern end of Islamabad and is divisible into three parts.

The northern part would have the Central Secretariat Complex. The first phase consisting of four blocks, "A, B, C and D", has been completed and the Central Government would shift there in November, 1966. The remaining four blocks, "P. Q, R and S", are in the advance stage of construction and are nearing completion.

In the central part is the hill which would have the President's House, his office and residences of his staff. On the western side of the presidential estate would be the Central Square with the foreign office on one side and the National Assembly on the other. The Central Square would be facing the Capital Avenue and would form the centre of national functions.

The third part of the Administrative Sector will have the Supreme Court, the National Archives and other similar cultural buildings.

ii) *Attached departments*

Originally provision for the attached departments was made to the north of the Central Secretariat blocks. Such an arrangement would have meant a movement of 31,000 persons by foot, bicycle, car and bus from the residential areas to their place of work concentrated in the Administrative Sector. This would have increased the volume of traffic to a great extent, particularly during the rush hours. In order to avoid any possibility of traffic congestion, or jam, the offices of the Attached Departments (like post & telegraph, telephone, police) and the Autonomous Bodies (like the Atomic Engery Commission) would be located in the lower part of Sector G-8 and the residential accommodation for the employees of these offices would be provided in the same Sector in the area zoned for this purpose.

b. *Diplomatic Enclave*

To the south of the Administrative Sector is the Diplomatic Enclave where all the foreign missions and embassies would have their chanceries and residences.

c. *Public Buildings' Area*

The Public buildings' area is located to the west of the Administrative Sector. Its northern portion would have the residences of the high government officials. Land has been reserved for the residences of the Nawabs and heads of States. In the central part of this area would be the radio station, television station, telephone exchange and head offices of various banks. The southern part would have buildings providing temporary residential accommodation. Hotel Shaharazad, the first building of Islamabad is located in this Sector and adjacent of it is the Government Hostel.

d. *Residential Area*

The residential area which means the proper town itself, in actual fact comprises of small townships linked by a central, commercial and trading unit. Each township is so planned that it is self sufficient so far as its daily requirements are concerned. Each township is a square with a side measuring 2,000 yards. The principal roads link each township or Sector with the other. In general, the residences would be near the place of work.

e. *Service Industries Area*

The southern part of the "G" Series Sectors has been reserved for the industrial and trading units. This belt would have all the

small industrial concerns like bakeries, service station-cum-show room, printing press, chips manufacturing, etc. In other words, the light industries in this area would mainly cater to the needs of the residents of Islamabad.

f. *The Central Business District*

The central business district, popularly known as the "blue area". is the heart of the city. It would have the main business and commercial buildings with the main road of Islamabad—the Capital Avenue going through it. Like all other functions this central business district is planned in the form of a belt parallel to the residential belts located to its north and south. Thus, with the growth of the residential area from east to west, the blue area can develop without coming across any hindrance.

Placing of various functions in parallel belts has made Islamabad capable of phased development in accordance with the availability of resources in such a way that every developed segment can serve as a self-sufficient urban unit. This can be better understood by examining the detailed layout of one of the sectors.

LAYOUT PLAN

In order to provide adequate walking space and security to human beings, pedestrian traffic has been separated from the vehicular traffic. No two sectors of Islamabad are identical. In general, the size of the plots increases from south to north so that the larger plots are nearer the hills. The total number and type of houses constructed in each sector determine the other services that are required and these services according to their magnitude are termed as "communities". In other words, communities are classified according to the number and type of functions performed in them. A community Class-I consists of a group of houses linked by a road. A community Class-II is formed by groups of communities Class-I with a common playground. A community Class-III, centres around a primary school while a community Class IV is defined by a secondary school. For example Sector G6, is a community Class-V and its details are as follows:

Sector G-6, which is almost complete, can be divided into the following four Sub-Sectors:

Sub-Sectors	Area in Acres	Total Number of Plots.
G-6/1	148	1,424
G-6/2	144	1,486
G-6/3	108	254
G-6/4	152	734

Sub-Sectors G-6/1 and G-6/2 have smaller plots ranging in size 125 yards to 250 yards and have houses of categories "A" to "D" meant for persons getting a salary of Rs. 125/- to Rs. 500/- p.m. On the other hand, plot in Sub-Sectors G-6/3 and G/6/4 ranging between 500 square yards to 1,200 square yards and having "E" to "G" type of houses are for officers getting Rs. 501/- to Rs. 1,800/- per month.

The community facilities in each Sub-Sector are related to the population. In Sub-Sector G-6/1, there are four Class-III Centres, each having a primary school, a mosque, a few shops and a public open space or park. All these centres have been so designed that the children can go to their schools without coming across any vehicular traffic. Similarly the housewives have to walk only a few yards to get the essential groceries, etc. In the centre of Sub-Sector there is a Class-IV Centre which has a secondary school, a bigger mosque and administration building, women's industrial home, a variety of shops, a covered food market, a sub-health centre and a subpost office. These facilities would be more or less repeated in the Sub-Sector G-6/2.

As regards Sub-Sectors G-6/3 and G-6/4, their plots taken together are less than those of either G-6/1 or G-6/2 and as such there is only one community centre between the two. This centre has an English medium combined primary and secondary school, a mosque, a picnic area, a covered bazar and a park. In this way the facilities are directly related to the number and type of people to be served.

The whole of Sector G-6 has a Class-V Centre which includes a bus-stand, two petrol filling-cum-service station, a field track, gymnasium and swimming pool, a community centre, a mosque for the entire sector, office buildings, municipal buildings, theatre, cinema, bank, offices, shops, police station, main post office, a big public garden and a hospital with indoor and outdoor facilities. The provision has been made within the sector for all the essential requirements making it a self-sufficient town-hip.

CONCLUSION

The grid fixing the position of the sectors and the Principal Roads is there for guidance but the detailed planning of the sectors would be carried out in phases based on development programme.

So far planning of six residential sectors (G-6, F-6, G-7, F-7, G-8, F-8) has been taken in hand. Similarly layout plans of the Administrative Sector, Diplomatic Enclave, public building area (G-5 and F-5), Islamabad

Park, Industrial Area (I-9 and I-ii) and Institutions (H-9) Communication Centre (I-8 and H-9) have been planned in detail.

In the planning of Islamabad there is a constant effort to retain the past cultural heritage; to incorporate the best of today that is within the country's means and to keep the requirements of the future in view.

Sind Industrial Trading Estate and Master Plan of Karachi

NAZEER AHMAD

DEFINITION

'Industrial Estates' is a British term. In America the terms 'Industrial Parts', 'Industrial Districts' or 'Industrial Tracts' are more commonly used.

An Industrial Estate has been described as a 'Tract of land' which is sub-divided and developed according to a comprehensive plan for the use of a community of industrial enterprises. The plan must take detailed provision for streets, roads, transportation facilities and installation of utilities. The plan may provide for erection of factory buildings in advance of sale or lease.

HISTORY

The pioneering in the development of Industrial Estates took place in the United Kingdom and the United States. The famous 'Trafford Park Estates' founded at Manchester, England, in 1896 has been called the "Mother of Industrial Estates."

In the United States, the "Clearing Industrial District" began its operation in 1899 in Chicago.

In Europe, the Industrial Estates have been slower in spreading but it should be recognized that important Industrial Zones have been provided in many countries, especially in Germany, Austria, Netherlands and Scandinavia.

The successes of Industrial Estates in Britain influenced some of the Commonwealth countries like Canada, Pakistan and India to establish 'Industrial Estates' both for industrializing and decentralizing industry.

INDUSTRIAL ESTATES AT KARACHI

The first Industrial Estate established in Pakistan was at Karachi, during 1947-48. It was a post-war development project of the *Ex*-Government of

Sind, from which it derived the name, Sind Industrial Trading Estates, or briefly as SITE, Karachi. The Industrial Estate, soon assumed 'national importance' since after independence many industries were established here.

LOCATION AND LAYOUT

The main factors which governed the location of the Industrial Estate at Karachi were:

1. Availability of a large stretch of Government land, for which little or no compensation was paid:
2. Proximity to port and consequential facility for the import of machinery and raw materials:
3. Proximity to the business centre:
4. Availability of plentiful materials of construction:
5. Availability of skilled and unskilled labour.

S.I.T.E. Karachi occupies 4,008 acres of land. The initial layout was planned by Lt. Col. Swayne Thomas, then Consulting Town Planner of the *Ex*-Sind Government. The main Avenues, running along the length of the Industrial Estate, were laid parallel to the wind direction with a view to do away with smoke nuisance. A railway siding, also running along the entire length of the Industrial Estate, was provided to serve industry. The railway siding was connected to the West Wharf.

Minor improvements in planning were incorporated during 1950-51. It was initially intended to have different zones for the following:

1. Textiles and Allied Textiles
2. General Engineering
3. Food Stuff and Beverages
4. Chemicals
5. Special Products
6. Obnoxious Trades.

Areas also were reserved for Workers' Housing. The 'obnoxious trades' have been eliminated, although strict zoning has not been possible.

SITE AND MASTER PLAN OF KARACHI

(i) *General*:

Karachi is the largest urban centre of the nation and SITE Karachi is her largest Industrial Centre.

The Master Plan of Karachi aims to encourage 'harmonious growth' of various functions. So far as the growth of industry in Karachi is concerned, SITE is fulfilling the objectives.

The SITE is planned to fit into the Master Plan of Karachi. It is accessible from the city by five different approaches. Its roads are integrated with those of the city and the Karachi Circular Railway, and links into West Pakistan.

(ii) *Factory Buildings:*

The construction of factory buildings in SITE area is controlled by the following with a view to ensure that the growth of industry in the area does not create slums, cause hazards or be a source of nuisance to the adjacent residential areas.

1. Current Building Regulations:
2. Requirements of Inspector of Factories:
3. Requirements of the Inspector of Explosives.

(iii) *Employment Potential:*

SITE Karachi has 641 factories/mills. The tradewise distribution is:

		No.
1.	Textiles	75
2.	Allied Textiles	110
3.	Oil and Soap	25
4.	Silk	30
5.	Foodstuff	20
6.	Chemicals	61
7.	Engineering	150
8.	Plastic	20
9.	Misc.	125
10.	Commercial	25
		641

a) Number of factories in production	595
b) Number of factories under construction	33
c) Number of factories coming up	13
	641

About 100 acres of land still remains available for more industry.

The existing industrial activity has provided jobs for about 1,00,000 persons including highly qualified engineers, scientists, chemists besides ministerial staff, technicians and skilled, semi-skilled and unskilled workers.

When fully developed, it is expected that SITE Karachi shall provide jobs for about 1,50,000 persons.

(iv) *General Services:*

General services for the convenience of the industrialists and their staff have become economically feasible at SITE Karachi, as a result of an aggregation of a sufficiently large number of industrial concerns.

(v) *Housing:*

About 650 acres have been reserved for Workers Housing in the form of two planned colonies.

Normal amenities like parks, playgrounds, schools, mosques, markets and dispensaries have been provided in the planning of the colonies.

It is intended to house about one-third of the ultimate workers' strength of SITE, in these two colonies, which will have about 50,000 dwellings units.

Buildings Regulations for "Standard Dwelling Units" have been carefully laid down, with a view to provide adequate comfort for the workers and their families.

Not more than one-third of the total dwellings shall be for bachelors. The rest are:

a) Single-room Family Units —For a small family of 2 to 3 members.
b) Two-room Family Units —For a family of 4 to 6 members.
c) Three-room Family Units —For a family of 4 to 6 members (but of higher income group).

(vi) *Amenities:*

Adequate amenities have also been provided at SITE Karachi.

The following already exist:

A 200 Bed Hospital
A Stadium
An Auditorium
Six Banks
Thirteen Petrol Pumps
Two Shopping Centres
One Model School
Seven Mosques
One Police Station
Two Post Offices
One Telephone Exchange

One Employment Exchange
One Polytechnic Institute.

(vii) *Communications:*

The network of roads provided in SITE area, with the Main Avenues linked to the city, provided adequate communication facilities to the workers and also for the movement of goods. The Karachi Circular Railway, passing through the area offers further communication facilities. Four stations are located in the area.

Problems

Housing:

Although about 650 acres of land have been reserved for two residential colonies for the workers, only about 35 acres have been partly utilized for the construction of not more than 400 dwellings so far.

The procedure is to allot land in residential colony, to an industrialist in SITE area, in order to enable him to provide dwellings for one-third of the workers engaged in his industry.

The construction of dwellings for the workers, on the part of the industrialist, is just a voluntary affair and there is no statutory provision binding the industrialist to construct such dwellings. The industrialist has two considerations:

a) He does not want to block his capital in constructing dwellings for the workers, especially when the capital can be better utilized in expansion of the industry.

b) The dwellings must, for the most part, be subsidized by the industrialist. The 'standard rent' of a dwelling, based on capital cost depreciation, repair/maintenance, etc. shall normally be more than what a worker can pay. A reduced rent shall, therefore, have to be charged for the worker, and the difference be subsidized by the industrialist.

c) He has no backing of law to have the dwelling vacated as soon as a worker leaves his employment.

It is therefore, absolutely essential that 'Law' should be promulgated binding the industrialist to construct dwellings for at least one-third strength of the workers, over a period of not more than the next five years.

It should be emphasized on the industrialist that 'subsidizing the rent' should be considered as an additional facility given by him to the workers.

The 'Rent Restrictions Ordinance' should also be amended suitably to enable the industrialist to have the dwelling vacated as soon as a worker leaves him.

ii) *Industrial Waste*

Industries generate a variety of industrial wastes. If the wastes are mixed in the sewerage system, they interact, producing acids, alkalies, gases, solids, etc., which in turn will not only block the flow of affluent but will also damage and consequently reduce the life of, the sewerage system itself.

Besides, no "Sewage Treatment Work" can undertake to treat the combined industrial waste from different industries, on account of its complex composition. As such, the industrial waste must be Pre-treated, if required, at each factory premises, to conform to the international standards, with a view to render it:

a) Natural	—to avoid interaction with waste from other factories,
b) Harmless	—to avoid damage to the sewerage system and the Treatment Works.

Unfortunately, the industrialist does not fully appreciate the delicate nature of the problem. He wants to avoid the responsibility of the additional task involved in pre-treatment and he also desires that his money should not blocked in the pre-treatment arrangements to be had by him. The running cost of pre-treatment is, of course, another consideration for him.

The industrialists, therefore, expect the management to receive their industrial wastes as they are and to pre-treat the same on community basis. This is not physically possible.

It is, therefore, necessary that a 'law' should be promulgated binding the industrialists to pre-treat their industrial wastes according to the required standards.

RECOMMENDATIONS

From what has been said and from the experience gathered from visiting the Industrial Estates abroad and from the development and maintenance of industrial Estates at Karachi, Hyderabad, Kotri, Tando Adam and Sukkur, the following recommendations are made:

I. Unless proximity to the seaport is an absolute necessity, establishment of further industry in Karachi, should be discouraged. This would

prevent congestion in Karachi and reduce problems of housing, services, traffic, health, sanitation, etc.

"Work" should preferably be taken to the people rather than dislocating people to reach the work.

The time taken to 'travel to work' should not generally exceed half an hour, if best efficiency from the workers is expected. Failing this, the workers will be faced with many socio-economic problems and shall work with reduced efficiency. Their mental health will also be affected. It will be wise to disperse further industry with a view to:

a) scatter employment opportunities throughout the country
b) prevent congestion and avoid high cost of living
c) prevent dislocation of population and avoid housing problems
d) distribute industrial activity.

II. Work must be created in an area (or township) simultaneous with the development of residences. An Industrial Estate, like SITE Karachi, without adequate housing for workers, is incomplete. Similarly a township like Korangi, without adequate work for the residents is also incomplete.

It has been observed that most of the workers of SITE Karachi come from far areas like Korangi and Landhi, where there is not adequate work for them. This creates unnecessary traffic problems and adversely affects the economy of the workers, besides a waste of their time and energy.

If only the housing for workers could have been developed in SITE Karachi, where land has been, and is still available instead of constructing the residences first in Korangi, the problem could have been solved.

Water Supply Utility & Sewerage and Sewage Disposal with Special Reference to Karachi

A. F. Nabi Baksh

Importance of Water Development and its Needs and Purification

During the initial stage of growth of civilisation and community life, people in groups settled close to perennial rivers and other sources of water. Man's thinking subsequently led to the conception of the idea that such essential need of life could be controlled and made more responsive to consumers' needs. Such controlled actions took, to start with, two forms: (i) to protect and enhance quality and (ii) to improve accessibility and availibility. The beneficial alteration in the quality of water may antidate 2,000 B.C. History tells us about the existence of water supply and distribution system in Alexandria in 47 B.C. when Caeser took possession of this imperial town and water was being drawn from the Nile by aqueducts designed to bring water into cisterns for clarification and sedimentation before supply.

As man increased in numbers, migrated and settled in groups on fertile land in greater physical safety he demanded for supply of sparkling and disease-free water. This created the responsibility of water engineers who are, by now, actively engaged world over to manufacture such water at a reasonable cost.

Water was not blamed carrier of discomfort and destruction till 97 A.D. when Sexlus Jubies Fontinus, the then Curator of Acquarim of Rome wrote a treatise on the need of purifying water before human consumption. Research study, experiments and practice in water supply utility system have followed such initial recognition. As civilisation advanced, the need for pure water and works to bring it and distribute to urban groups increased. Today the immensity of some water collection and purification works is astonishing. Constant biological research and investigation conducted all over the world has led to recognition of the part played by water in the initiation and transmission of disease and other bodily disturbances. It is now universally recognised that there is a frightening array of agents which can exist in water and affect the human health.

It is now universally agreed that water should be treated in bulk and distributed economically in areas of population concentration. Water

engineers all over the world now recognise that quantity and ready availability of water are as important as quality as it is difficult, rather impossible, to maintain a satisfactory level of personal cleanliness if water, pure and free from contamination and parasites, is not made available at close range. It is, therefore, essential that a programme of urban water supply utility should aim not only at safe water but safe water in ample quantities piped in premises or immediately adjacent.

According to statistics given by medical men, man's water intake per day should be 3.1 percent of his body weight. Thus a man weighing 150 lbs should consume 2 to 3 lbs of water from the taps, the balance 1.5 lbs is contained in the intake of food.

Water is also constantly needed for cleaning and washing purposes and therefore to achieve the minimum hygienic standard in a community, supply of potable water should be made in abundance, not less than 30 to 40 gallons per capita per day (for domestic use alone).

Supply & Distribution of Potable Water in Karachi

The city of Karachi is surrounded by the Arabian Sea and the desert of Sind. The nearest perennial river is 100 miles from Karachi. Also, Karachi has experienced drought for last four years, creating serious shortage in that part of the city which exclusively depends upon yield of raw water from underground sources—chain of wells, in Dumlottee, a village situated at a distance of about 20 miles from this city and on the bank of a river which flows only when there is rainfall in abundance.

Water Supply Utility for Karachi—its Need and Growth

In 1947 the city of Karachi was provided with a water system capable to process and supply at 20 million gallons a day required for its pre-independence need of a population of 3.50 lakhs. With the influx of refugees pouring in from across the borders the city population increased to one million by 1951 creating acute shortage of drinking water. To meet the additional need, the city supply was augmented by 10 million gallons a day by duplicating storage and supply capacity of Haleji Lake, then a catchment area situated at a distance of 56 miles from Karachi.

However, the city of Karachi having been deprived of water from underground and annual rainfall being meagre, 0 to 15″ (maximum) a year, it was ultimately considered necessary to connect this city's water utility system with the source of raw water from river Indus.

A team of consultants sponsored by Point 4 Programme visited Karachi in 1951 and reviewed the water supply, sewerage and sewage disposal prob-

lems of greater Karachi area. They diagnosed serious shortcomings and deficiencies in these facilities and recommended immediate actions for providing these services at desirable level. They concluded that these inadequacies might ultimately lead to making this city the nucleus of diseases in epidemic form. The then Karachi Joint Water Board and the Central Government of Pakistan recognised this need and ultimately framed a scheme known as the "Greater Karachi Bulk Water Supply Scheme" and its two ancillary projects named the Greater Karachi Water Trunk Mains Scheme and the Greater Karachi Sewerage and Sewage Disposal Scheme. These schemes have now been completed with foreign exchange need provided by the US Agency for International Development.

Successful completion of these three schemes has augmented the city's water supply capacity by 70 million gallons a day and provided along with a number of Sewers and Water Trunk Mains, two Sewerage Treatment Plants with a total and combined capacity to deal with 40 million gallons of sewage a day.

Need for Repeated Augmentation

Experts have tried for years to gauge the increase of population for urban areas, but population explosion refuses to be accurately calculated. The survey made by M.R.V. (P), the firm of expert Town Planners, appointed by the Government of Pakistan, had forecast in the Master Plan of 1951, a population of three million by the year 2000, whereas it is already by 1966, close to three million, such extraordinary rapid growth in population due to natural increase and migration from across the borders with India coupled with those coming from rural areas to Karachi in search of employment and better living conditions has again created acute shortage of potable water in Karachi leading to the need for more water. Thus to meet this growing and ever increasing need, the Karachi Development Authority has again proposed to operate a set of projects augmenting supply of finished water to this town by another 70 M.G.D. in course of next three years of the Third Plan period.

Alternative Source of Potable Water

There have been in the course of last 100 years, known to water engineers seven basic and well known methods of water purification; namely—prolonged storage and sedimentation; filtration through slow sand filters; coagulation and filtration through rapid gravity filters; combined water softening and iron removal, coagulation and filtration through rapid sand filters; watersoftening; iron and manganese removal and disinfection by chlorination.

There has, however, been tremendous development in the attempt for conversion of water from the sea into potable water and the Department of Interior of the Government of the United States of America have so far invested millions for achieving this cherished goal *viz.*, to produce drinking water from the yield of sea at an economical cost. Though the cost of such conversion, namely by the method known as "FLUSH SYSTEM", is almost Rs. 5.0 per unit of 1,000 gallons, it is expected that heating power drived from the nuclear source, expected to be very cheap in near future, would enable such conversion to be economical, ushering into coastal cities of the world an era of abundance and cheapness of potable water. As to whether such achievement will be made during this century is anybody's guess. I personally envisage such supply to Karachi in course of next 25 years.

Water Supply Business

Water supply is a business which must be administered and managed on no profit and no loss. The cost of water payable by the consumer should, therefore, cover all costs *viz.*, capital and recurring required for conducting the water through underground pipings, processing and filtering and distributing it equitably making this essential need pouring in from house faucets.

Water costs money, yet the peoples' attitude that "like air and sunshine, it is a gift of God;" and therefore, it should be supplied free has created a hazard which the authority responsible for management of water utility in Karachi has failed to overcome. The educators, social scientists and city politicians have so far done very little in Karachi in educating the water consuming public on the necessity of paying for water they use. The result is that from the Municipal area of Karachi alone there is an arrear of cost of water payable by the beneficiaries which amounts to Rs. 4.5 crores.

Differential Rates

Though required in equal quantities by all living in an urban area, there being a large gap in the earning capacity of the rich and the poor, privileged and under-privileged, it is for consideration if water producing and distribution agencies in urban areas of Pakistan should adopt "Differential Rates" for cost of water leading to comparatively higher rate payable by industries, commercial houses and high income groups of the community and thus making up the deficit created in the water revenue due to non-payment or payment at nominal rate by those whose ability to pay for such utility services is limited due to poverty.

The Sewerage and Sewage Disposal

For disposal of sewage/sullage the KDA has adopted the principle of complete treatment involving treatment of all sewage from this city by the

process of sedimentation by oxidation and dual action filtration. In operating this scheme at a total cost of Rs. 10.0 crores the KDA has laid 67 miles of sewer (pipes) mains with diameter ranging from 15" to 72" and erected two Sewage Treatment Plants with a total capacity to deal with 40 million gallons of sewage a day. While erecting these two Disposal Plants, the KDA has adopted the complete treatment system. The residual effluent discharged from these two plants, after having been subjected to vigorous and repeated treatment by aeration and dual action trickling filtration, is inocuous, free from disease carrying bugs. Effort is, therefore, being made to utilise this effluent from these two plants for irrigating land around Karachi and thus provide additional food for the country.

Some Problems of Urbanization in Lahore

Nazir Ahmad Jiabajee

History

The city of Lahore is situated in the Lahore district in the alluvium plain of West Pakistan in an agricultural setting with Kasur tehsil in its South, Chunian tehsil in the South-west. Like towns in Europe, it got special importance after the industries developed. The District of Lahore is approachable by highways like Lahore-Peshawar road, Lahore-Multan road, Lahore-Kasur road and Lahore-Wagha road. These are the main arteries which carry manufacture, trade and serve as transport for the rural and urban areas. The population of this town by 1851 was about 50,000 by 1861, when the steam-age set in, it became 80,000.

According to the Encyclopedia Britannica[1], there are four major factors which gave rise to the process of urbanization:

1) Agricultural productivity.
2) Factory system.
3) Transportation & Communication for workmen.
4) Population growth.

The causes of urbanization of Lahore developed toward the end of the 19th Century. These were:

—Industrialization
—Educational centres located in Lahore
—North Western Railway workshops
—North Western Railway administrative offices
—Punjab Regiment and other Government offices located in Lahore
—Lahore was made the capital city of the Punjab
—A Brigade headquarter of British and other offices were located in Lahore Cantonment
—It became the centre for the transport of the consumer goods.[2]

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[1] Encyclopedia Britannica, Volume 22, Edition 1962.

[2] Jiabajee N.A., Administration of the Watersupply Organization of the Lahore Corporation. Term paper for P.A. 17, Faculty of Public Administration, Punjab University, 1963. Unpublished (Page-1).

After independence in 1947, two factors largely caused the population expansion of Lahore City. These were rapid expansion and diversification of the industrial base and the large migration of refugees from India and Kashmir.

The population of Lahore in the 1961 census was:

Lahore City: No. of houses	...	...	2,03,883[3]
Persons per house	... ...	...	6.1
Lahore M.C. Population ...	...	...	12,39,014
Lahore Cantonment	... ...	...	68,496
	Total	...	12,97,510
Lahore Tehsil rural population	...	...	30,08,797
Lahore Tehsil urban population	...	...	13,18,175[4]

URBANIZATION NEEDS

i) *Planning*

It is expected that the 125 sq. miles of Lahore will expand to 180 sq. miles in course of next years.

Only by such a long range policy can the needs be properly met. This process will involve special research within the following considerations:

a) Identify the present and future needs and problems of land uses.

b) Develop comprehensive plans with research participants and public participation.

c) Enactment of zoning ordinances, and proper improvements, and renewals.

d) Careful collection of field data of meteorological records, underground hydrology, communication and transport requirements, water needs, drainage disposal, power and gas requirements. Besides this there will be communication and recreational and health needs of the community, including housing, business and commercial premises and factories, construction and transportation. Any deficiency in careful compilation of requirements will be uneconomical and unsocial.

[3] *Lahore District Census Report*, 1961, Part III, Table 2.
[4] *Ibid.*, Part V, Table 7.

ii) *Watersupply And Sewage*

The water requirements of Lahore in 1881 were 10 gallons per person which was increased to 20 gallons in 1901. In 1921 the requirements were further increased to 30 gallons.

The water supply and drainage proposals of 1935 set the goal at sixty gallons per person per day.

In the design for the 1981 to 2001 the figures of consumption, considering the requirements of industrial and domestic needs, the figure to be considered should be minimum of 75 gallons to be increased to 100 gallons per day per person. Modern society needs plenty of good water and proper drainage and nothing can be more annoying than the odor from an overflowing sewer in a street or basement or a dry tap. Regarding disposal of sewerage the adequate flow, collection and treatment, needs a careful watch. Lahore has no treatment works. There are plenty of sewage lakes that present unhealthy surroundings and most of the lands in depresssion near the outflow sewer are sewage sick and is polluting the river besides contaminating the water of lower reaches and killing the fresh water fish.

Almost all the suburbs are without proper sewers and some pockets of the civil lines had no consideration to claim attention of providing even connecting drainage for high class bungalows.

The industries also have no waste disposal plants.

Treatment of sewerage system may entail another decade after help from World Bank is obtained.

a) *Storm Drainage*

During the Moghal period Lahore was adequately provided with storm drainage but with the modern urbanization all the natural drainage lines have been interfered with. The storm drains have been covered to provide access for communications or more space for door entrances, or for the vendors.

Some of these have been silted up due to carriage of water born sediments or have been turned into sewers or dumped with refuse and sweepings by the benevolence of the local sanitary staff during the last three decades.

Long delay in a programme for new sewer construction has resulted into this serious menace.

It should be noted that the storm water when it is not drained out properly damages property in the areas of Misri Shah, Shad Bagh, Faroque Ganj,

Sanda Kalan, Krishin Nagar, Sant Nagar, Rivez Gardens, Chauburji areas, Nawan Kot, Samanabad and renders communication impossible.

This is partly due to inadequate storm drainage and also silting up of the lower reaches of the main storm drain which empties into the river Ravi. The conditions are worsened when the river Ravi is in high floods and Lahore gets a heavy rainfall.

The Corporation has a squad of sewage lifting pumps which relieves this precarious situation for short intervals.

b) *Water supply and Distribution*

Lahore was situated on the bank of the river Ravi. The river had been meandering and the main stream is now about a mile and a half away.

There is ample supply of good water in the acquifers from 250 to 500 feet in the alluvium deposit underground, which is recharged during summer and winter monsoons.

Since 1925 tubewells have been put in which number about 102. A 10″ diameter strainer about 120 feet in length gives an easy discharge of about 33,000 gallons per hour at a depression head of about 6 to 10 feet, while the spring level varies between 15 to 20 feet below ground in areas outside the walled city.

Recently gravel packed strainers have been located with about 4 inches of crushed gravel around the screen which have been discharging about 45,000 gallons an hour at a depression head of 8 to 10 feet, which performance is very encouraging.

The watersupply facilities afforded by the underground water are ample for future use.

If more pumping is required it would be better to have bigger tubewells with good interconnected electrical grid.

Electric motive power is much cheaper than diesel for water lifting, and electric submersible pumps more economic. However it may be remarked that the staff pays less attention to submersible pumps than to electrically operated vertical spindle borehole pumps.

For air-raid precautions for an urbanized city a judicious number of diesel propelled pumps will be essential, besides electric power or generated electricity produced by portable electric generators.

c) *Distribution Deficiencies*

The city distribution is practically a hundred years old and the steel pipes, turned and bored pipes, wrought iron pipes are at many places badly rusted, pitted or encrustrated, and have little use.

With any increase in pressure they blow up, frequently damaging the houses in the streets.

In the urbanization programme replacement of old system of distribution with a bigger diameter of water pipes would be necessary. These pipes may be ductile pipes or cast iron pipes of the Tyton type of the recent production of cement asbestos pipes or the P.V.C. pipes.

The layout of the house connections from the distribution pipes in the city is the most undesirable sight to see as frequent leakages, of C.I. Pipes above ground, frequently sucks in polluted water or sewage during non-supply hours, and these cause inconvenience and obstruction to the pedestrians.

There are thousands of such unhygienic cases inside the city distribution which need attention during replanning for the process of urbanization.

Moreover as the intensity of population is on the increase it would be desirable to lay double pipe line along buildings and wide roads to avoid very frequent road cuts. This will also diminish the leakages of water mains in the centre of the roads, which are very frequent sites to be seen in Lahore. With further development such cases are bound to increase. Incidentally the same will also be true of the individual house connections to the sewers to serve the row of houses on each side of wide roads.

TRAFFIC

Another serious problem is that the traffic has increased due to automobile ownership and use of other vehicles.

The roads are deteriorating and there is no satisfactory maintenance. Traffic congestions are frequent particularly during the rush hours.

i) *Parking*

Parking spaces are not provided in the congested city areas nor in the Civil Lines. This facility has not been provided even in the recent development of the townships. For modern society this convenience is essential.

ii) *Mass Transit*

During the peak load hours when the educational institutes, offices and business premises open there is a great rush of traffic and the same is repeat-

ed at the closure hours. This inconvenience can be got over by mass transit facilities like buses and Omnibuses, which should be utilised by majority of the citizens.

In short in urbanization programme traffic facilities, mass transit and parking must be planned and programmed, by providing adequate good wide roads, and streets and effective traffic control, both inside the city and outside in the civil area. The facilities for water sprinkling and street cleaning and washing will have another draw on watersupply distribution.

Urban Renewal

In the city area of Lahore there are many old houses which were built a century or two ago with poor materials and they have outlived their utility. These are congested, neglected, insanitary, with poor light and ventilation with no or inadequate watersupply and drainage and fire fighting facilities. Some of these have been occupied by the refugees from India and Kashmir and these are deteriorated, compounded by neglect. Deaths by falling houses is not an infrequent occurence in the city of Lahore and there has been no planned urban renewal or removal of slums or blight. No efforts have been made by the Government or the Rehabilitation Department with the above objective in view.

This defect frequently leads to broken ferule of domestic connections, broken pipelines which subsequently lead to settle a large area of houses and damage the property in the environments. Such cases do frequently happen.

Parks and Recreations

Within the walled city of Lahore there are no spaces for parks or recreation centres. The streets are very narrow and winding. The buildings are old and two to three storeyed, built decades ago.

Outside the walled city used to be a periphery of gardens and parks. With the increase in traffic and extra transport the parks were filled up in the last two decades to provide roads to cater for the traffic of the city and thus the facility once available has died out.

Whatever has been left of these gardens are not getting the regular supply of the canal water. Water for gardens, trees, lawns and hedges is taken from the main distribution system as and when available after the needs of the public.

There is only one public swimming tank in Minto Park open for summer bathing of the citizens, others prefer to go to the canal for a swim.

Educational institutions have mostly their own swimming pools of moderate size, for training the students. In the industrial sector, Packages Ltd. has got a swimming pool of their own for use of bathing and swimming which can also be used for fire fighting purposes.

Though rules provide that industrial concerns should have water storage for fire fighting purposes as tanks etc. but this necessity has not been provided in many cases. One of the uses of the swimming pools is that when the fresh water is pumped into them, the overflow or the drained off water is used for lawns and trees and hedges. Further it has been noticed that the water used in the lawns and parks belonging to the Corporation is tapped from the distribution system which causes deficit of water supply for public and domestic use.

It has generally been noticed that the garden staff will water the trees, hedges and the lawns during the public supply hours which adversely effect the utility of the distribution system.

In the future development programme of the urban town all spaces for gardens and recreational needs be conserved and independent water supply be provided for these community facilities in the main township, villages and satellite towns.

Law Enactment

There are many deficiencies that occur in the Corporation working due to lack of law enforcement. The police reserve have to be borrowed to carry out these functions or approach has to be made to local police stations for help and security. With the increase in population, and consequent activities of construction and encroachments, the following difficulties crop up:

i) Action has to be taken against unauthorized construction or deviations from the sanctioned plans. The lengthy procedure which causes delay and creates difficulties are the following:

a) Notice to stop work under section 115(4) of the Municipal Administration Ordinance 1960.

b) Prosecution under section 116/118 of Municipal Administration Ordinance.

c) Show Cause Notice under section 78(2) of Municipal Administration Ordinance.

d) Notice for Deviation under section 78(3) of M.A.O. of 1960. For the last, police force, demolition charges and supervisory staff has to be utilised.

Demolition charges have to be recovered from the person at fault. For this, help of the local revenue branch of the Corporation is needed. These offences by the citizens are on the increase with the urbanization and the methods adopted delays the quick action. This complexity is most undesirable in the constructional programme of the Corporation.

ii) Removal of unauthorised use of road land by the police force. This is an every day occurrence. Usually the above work is done by ten numbers of policemen on the roll of the corporation but where trouble is apprehended aid is sought from local police stations and armed police is got if further necessary.

Interference with the pipe line distribution wastageof water and interference with the drainage system sometimes does happen and it is very rarely that police aid is sought, however it is anticipated that in the time to come serious cases are apprehended of interference with sewage flow for which more police aid may be needed.

Fire Protection

The original scheme of watersupply of 1875 for the city of Lahore catered for fire protection, and a few public stand posts for drinking watersupply and street hydrants for washing of sewers. Fire fighting arrangement existed at the central fire stations near the reservoir placed at the highest point in the heart of the city at Lange Mandi.

When the housing developed in the Civil Lines area another fire station was located near the Town Hall.

By the beginning of the Second World War three more stations were located one at Queens Road, the Second at Shahdara and the third at Baghbanpura.

After independence in 1947, the population density and fire hazards were carefully studied together with possible threat to the urbanized population from any hostile attack of an aggressive country.

This needed a reappraisal of all possible needs, resources available for fire fighting and air raid precautions. This study disclosed that at least one dozen more fire stations were needed depending upon the population density and other essential requirements for peace and war.

It was however presumed that the factory owners were responsible for the power protection of their factory area and the Director of Industry had to check up these places for needful arrangement.

The fire incidences are increasing, and the citizens are not yet educated enough to register for fire insurance.

Even most of the government offices do not have rudimentary fire protection arrangements and the private concerns are still ill-equipped.

The present number of fire hydrants is 500 out of which 250 are in working order; others are either buried or closed and these are not enough and the pressure in the pipelines inadequate. Multi-storeyed buildings are on the increase, but proportionate precautions for fire protection are not being taken. High turnstyle ladders are yet being arranged by the Lahore Municipal Corporation, but there is the difficulty of foreign exchange for getting these.

In the distribution pipe lines there is no adequate pressure, and every time a fire breaks out a water tender is taken by the fire fighting squad.

In the future programme of the urbanization adequate facilities for fire fighting have to be arranged with adequate personnel to be suitable selected for the necessary requirements of fire fighting and introducing sufficient distribution under pressure to cater for the needs of fire requirements. This should be done progressively with every new distribution system or replacements. This will keep low, the charges of fire under-writers.

Garbage and Refuse

It has been observed that wherever there is habitation or human occupation there is garbage and refuse. When the industries are built they contribute waste. All these contribute to health hazards if welfare of the citizens are not taken into consideration. For the garbage and refuse there are two considerations, the first being the collection and the second the disposal. The disposal of garbage and refuse is a still serious problem than the collection.

Both the garbage and the refuse can be dry or wet. In the wet state it creates a still greater nuisance. The practice in Lahore is dumping or in cases land filled operation but the second presents difficulty because of non-consolidation. Industrial waste problems have not yet been taken into consideration and an effective ordinance yet is not in vogue. Any increase in population due to urbanization increases this problem of collection and disposal. Some of the countries now advocate pulverising of the refuse and the usable refuse is used as a manure. In Lahore the refuse either goes directly into the fields where it gets decomposed or is taken for damping ground for composting purposes. It has been observed that the refuse collecting dumps, plant forms and other such places are not washed, cleaned and taken care

of and as such at some places rodants, mosquitoes or the flies breed. This factor of garbage and refuse collection and disposal is acute but at some places there is the problem of night soil also involving a still greater difficulty in its disposal. Sometimes the vehicles plied for the above are uncovered and thus litter the roads besides being unaesthetic to the public. With development of population this problem will still be acute.

Economic Considerations

The town of Lahore had grown, is growing and will grow. Capital investment is needed for greater watersupply and drainage. A project of about 48 crores has been worked out and so proposed to be financed by the World Bank. This will be a loan with a nominal interest to be paid back but the watersupply and drainage schemes shall have to be made self supporting.

The Corporation has been lacking in properly adjusting the cost of, watersupply maintenance, drainage disposal and the interest on capital investment. This lack of coordination between the spending organization and the Revenue Collection Department has been a cause of mal-adjustment of the expenditure and revenue receipts. The difficulties that existed will continue to exist and will become still more intricate when the World Bank advances loan and it has to be paid back along with the interest.

The following are the various causes of disparity between income and expenditure:

1) Free supply of the water for the following purposes:

   a) Public stand posts.
   b) Fire hydrants, flushing tanks etc.
   c) Cattle troughs and public toilets.
   d) Water supplied for fairs and congregations.
   e) Water for gardens, lawns and hedges.
   f) Water for educational institutions, health institutions, municipal buildings, offices and workshops etc.
   g) Water for recreational places, fountains etc.
   h) Water for street sprinkling and street washing purposes.
   i) Water for drain flushing.
   j) Stand posts for Bahishties (water carriers).

2) No fees are charged for the following:

   a) Garbage and waste material collection and disposal.
   b) Sewage connections.

3) There is inadequate control on the following:

   a) Disposal of farm sewage as lot of it is wasted.

   b) Proper control on the sale of farm sewage as most of it is missappropriated than that which gives financial benefits.

   c) Depreciation and amortization accounts are not properly maintained for capital investment on watersupply, drainage system and garbage collection arrangements.

4) No progressive fixation of the water rates according to the increased cost of maintenance of watersupply and drainage disposal.

   Cost of garbage collection, disposal, energy materials, haulage facilities and personnel have increased manifold. With further increase in population building activities, extension to the town and suburbs, more difficulties will be met as urbanization proceeds.

LEADERSHIP COMMUNICATIONS

For any organization to be successful is involved effective leadership. While dealing with urban towns there will be two major aspects of these problems. One will involve the roll of the governmental officers to watch the interest of the Basic Democracies as a whole and the other will be the representation of the civil population. There is to be a productive relationship between the community leaders consisting of the government officers and the civic leaders together with the roll played by the citizens. What has been noticed is a rapid transfer of the Government's representatives who headed this institution.

The second is that some of the selected Basic Democrats are undereducated.

The third most important element is the citizens who want individual benefits by trespassing the rules and regulations. The councillors are representatives of the citizens and look forward to a vote for election. They pay back by individual favours to the citizens which create trouble for the administrative officers who are trained to respect rules and regulations, codes and manuals.

It will create difficulties if the public nominated leaders are devoid of good knowledge, experience, culture, technical get up, administrative capabilities, financial insight so as to be able to work for the good of the town and its citizens on progressive improvement basis to benefit the community as a

whole. Urbanization has got an organic growth and to have strong and healthy growth there should be a coordination of the Government's representatives, representatives of the Public and officers incharge of the various sectors. There should be a close coordination amongst the Engineering Department and the Medical Department with due assistance of the Accounts and Audit so that there is no difficulty in smooth running of the municipal organization for the welfare of an urban city.

Problems of Water Supply in the Sind Industrial Trading Estates

MUHAMMAD MALUK

Sind Industrial Trading Estates (SITE) is sponsored, financed, and controlled by the Industries Department of the Government of West Pakistan. This organization is responsible for the development of the land for industrial purposes. All the facilities required for the establishment of industries are to be provided in that no extra expenditure by an individual industrialist has to be made. Thus the initial cost of establishing an industry is reduced by 20 to 30 percent The facilities provided by the SITE include:

1 Acquiring of land,
2. Providing roads,
3. Supply of water,
4. Providing drains,
5. Street lights, etc.

In this paper we are concerned only with the water supply distribution problems.

Water supply at present is the most uneconomical facility for the organisation. There are a number of factors which affect the economy of water supply. Some are technical and others are artificially created by human beings with ulterior motive. Technical problems will not be dealt with here. The problems created by the industrialists themselves or by strangers will be mentioned.

Usually it is believed that water supply is the work of engineers, but in my view an engineer has little to do with the water supply distribution. Water supply is a management job.

SITE gets its water in a bulk supply from the Karachi Development Authority. The main work of SITE is to distribute the water to the industrialists. For this SITE has laid its own service lines of different diameters. The first problem was to acquire the pressure pipes, at least 300 lbs head pressure, which would take much foreign exchange. It was not possible to

secure the foreign exchange to purchase the steel pressure or cast iron pipes. This problem was solved by providing pre-stressed cement concrete pipes which are locally manufactured and are found to be satisfactory. These pipes while jointed, work as a flexible line and are able to stand the expansion and contraction, and pressure fluctuation due to opening and closing the valves.

The most difficult problem is to lay down the pipe line in a proper place within the required time which is usually never met. The Master Plan provides different strips for different services, namely telephone cables, electric cables, Sui gas pipe lines, underground drainage, open storm water drains, water lines, main lines and sub-main lines. Usually, it is found that most of the services are not carried out through the strips provided for them, but that there is a lot of deviation and encroachment upon the strips left for other services. For example, electric cables are laid above the Sui gas line, and thereby creating a trouble. A telephone cable passes through the place left for water supply. Hence water supply line cannot be properly developed. The pipe line has to be shifted or taken below or above the line or has to be diverted to left or right. This not only involves considerable money by providing "bends", " specials", but also creates loss of pressure head and requires more money to complete the work. This problem has not been solved upto this time. The various departments are being persuaded to look into the matter. It is the responsibility of the officers concerned to ensure that the line is laid in proper position and to allow every service line to have its own route.

The worst problem is created when the water line has to pass under a railway track. The reply from the railway authorities is not received within a year or so. The result is that no water supply could be arranged to the industrialists on the other side of the railway line. Hence occurs a great loss by way of blocking the money, and retarding the progress of industrialisation. The railway line is necessary for communication of the labour and goods, but the problems created by it are a nuisance, *e.g.*, not to allow water pipe line to pass across it.

Having overcome the difficulties in laying the pipes, the following pre-stressed pipes have been laid:

1.	18″ pre-stressed pipes	=	29,000	Rft
2.	15″ -do-	=	11,700	,,
3.	12″ -do-	=	56,600	,,
4.	9″ -do-	=	38,400	,,
5.	6″ -do-	=	132,600	,,

These pipes were laid in a tree-type way starting from the trunk having its branches and ending with the dead end. The problem was that the pressure at the ends of different branches was different. Hence most of the mills were not getting sufficient water due to low pressure and increased fractional loss. This problem has been solved by joining the ends of different branches completing the circuit and equalizing the pressure throughout the line and transforming the system to a wheel type. This not only has helped to equalise the pressure, but also provided the means of supply of water to most of the mills which might have been affected adversely. Now one or two industrialists are affected at the time of bursting of the pipe line in that section. Hence the question arises whether the main line should be provided on the basis of a calculation of future requirements of water. Putting the line on a bigger diameter requires time for manufacturing the pipes and laying and jointing and also requires a lot of money which would be blocked without any return for many years to come. This problem is usually solved by putting a temporary line to meet the constructional requirements. The pipes used for the temporary arrangements are removed as soon as the main line is completed and commissioned. No doubt,there is some loss due to damages at the time of removing and relaying them including labour charges and cartage, etc., but that is very nominal in comparison to that of blocking money for years without return.

The losses in distribution of water supply are of many kinds:

1. Those which are done by the consumers themselves; when they use abundant water in their gardening and usually allow the water to flow in their gardens and lawns, while more than 50% water can be saved through sprinkling by use of rubber pipes and nozzles.

2. Most of the textile mills have the semi-cooling system in which water is used once and thrown away. This water can be collected and cooled and re-used. But this system is never adopted in this country as the collecting and cooling of water involves more cost than that of the water supplied.

It is usually found that strangers break down the hydrant and remove the valves for their drinking and washing purposes or for selling the material, leaving the whole line to flow freely on the roads. This problem raises havoc with the whole distribution system. Not only water is wasted and the water pressure reduced, but the water lines become "air-locked". Because of reduced supply most of the industrialists turn their valves on and off to check the supply of water. The result is that the valves remain closed and air remains inside the pipe lines and when the water is restored the pipe-line becomes air-locked; hence the pressure increases which results in bursting the pipe lines over and over again.

The industrialists usually send requests for quantity of water supply more than their actual requirements. This is because they do not know how much quantity of water is required by their industries or they think more water will come handy, at the time of low pressure. Hence a number of industrialists who have got more pipe lines than required by them usually take sufficient quantity of water and then close the valves; in this way many valves remain closed at the same time. Hence the pressure increases in other pipe lines, which results in the bursting of the pipe lines. Thus not only the problem of repairing the pipe lines arises, but also water is wasted. This problem has been dealt with in different ways. Some industrialists have installed large underground storage tanks. Another is that proper check is being made for the individuals while sanctioning water connections. The quantity of water is calculated on the basis of different requirements: as drinking purposes per capita, quantity required for bleeching and dyeing purposes for a unit of 1,000 yards of cloth, quantity required for one acre of grass and gardening. After assessing all these requirements diameter of the pipe line for supply is sanctioned.

Other difficulties are the leakages at the points of joints and connecting places of the valves and the specials and joints. This problem has not been dealt effectively upto this time. It is hoped that attempts to solve this problem would materialise in near future. The leakage in the pipe line is not easy to find as mechanical method or electronic detector has not been used upto this time. This will only be possible if we have small number of consumers. It is very essential that whenever leakage in the distribution system is located it should be repaired immediately. Leakages can be detected by applying the "listening devices", and is used in many countries but it has not been adopted here because there is no arrangement separating each section of pipe line by valves.

Water supply to the industrialists is measured by meters. Even though no meter is accurate, yet 90 to 95% accuracy of the meters can be tolerated. If the meter goes out of order the water supply is not recorded. Hence there occurs considerable monetary loss. Most of the industrialists being very clever, try to boost up their economy by removing the meters allowing the free supply of water in their tanks by clandestine tactics. The removal of meters creates the free flow in the air which reduced the pressure in the pipe line, which in turn stops supply to the down stream consumers or reduces it to a negligible degree.

Some industrialists very cleverly remove the fans from the meters. The fans are the main parts of meters and record readings of the water consumption. This difficulty has been overcome by sealing the meters with SITE's own seal, which has reduced the trouble to some extent but I am sorry

to say that it is very easy to counterfeit the same type of seals. Hence again occurs substantial monetary loss.

The problem of loss in water supply at the time of distribution is due to mentality of the consumers that multiplies the loss and creates difficulties in distribution. The total loss in various ways has been calculated which varies from 15 to 20% of the total water supply. If this loss is saved, it will not only reduce the cost of distribution but at the same time it will allow us to continue the same system of water supply without any hindrance.

The most pressing and confronting problem for the distribution system is the size of main line leading to various places. There is no grouping of industries and it is not possible to forecast what type of industry will subsequently link on the distribution line. For example, allottees for pumping set manufacturing require negligible quantity of water *i.e.* only for the drinking and gardening purposes; while a textile mill needs two to three lakh gallons per day. The entrepreneur who starts his industry is also not sure of his future programme. He starts with shaky mind and with a few thousand spindles and some looms. At that time a small quantity of water say 15 to 20,000 gallons of water per day is required. Later as he establishes himself he starts the finishing process, *i.e.*, dyeing, bleeching and printing and the water requirements increase over 1000% over night.

It becomes extremely difficult to cope with the industrialists' unexpected and abrupt increased water demands.

I have been able to only note a few of the urgent problems concerning water distribution in SITE. In closing let me again state, that the serious problems of this topic pertain to the human and not the engineering. You can design and construct a water distribution system with relative ease, the big task is to administer it.

Electric Power Requirements and Resources of Pakistan

M. S. QURAISHY

IMPORTANCE OF ELECTRICITY

Modern industrial production and urban life are impossible without an adequate supply of electricity. This is evident from the way demand for electricity has grown with the industrial growth in the country and the constant rise in electricity consumption in the large cities and towns in Pakistan.

At the time of Independence, the consumption of electrical energy was approximately 204 million kwh including the units imported from India. By 1965, it had reached 4,440 million kwh or more than twenty-two fold increase. The history of electric energy consumption of the city of Karachi, which was served by a progressive utility at the time of Independence, offers an interesting example of electrical consumption in an urban area.

In 1947, the gross consumption was 32.4 million kwh. By 1964 it had reached 634.6 million kwh, or a more than twenty fold rise in just 17 years. In the same period the number of consumers had increased from 32,789 to 146,986. These figures do not include the industry-owned generating plants.

Careful planning is required to meet the electrical needs, if the present rate of development is maintained.

ESTIMATES OF SHORT-RUN REQUIREMENTS

The short term requirements are based on the planned development of various industries (such as textiles, cement, and sugar), agriculture (such as tube-wells and pumps), communications (such as railway traction), and commerce.

Since presently various regions of the country are served by separate power systems, the requirements were worked out separately in this paper for each system. West Pakistan is presently divided into the following four systems:

1. The northern grid system, comprising the former provinces of the Punjab, North-West Frontier province, and the State of Bahawalpur;

2. The Southern System, comprising the former province of Sind, the State of Khairpur and a part of Baluchistan;

3. The Karachi Area; and

4. The Quetta Grid, serving parts of Quetta and Kalat Divisions.

East Pakistan, on the other hand, has been treated as one unified system.

Table 1 summarises the estimated demands for the Third Plan period for these five systems.

TABLE 1

Estimated Demands of Different Grid Systems of Pakistan —Third Plan Period

(Megawatts)

Year	West Pakistan				East Pakistan
	Northern Grid	Southern Grid	Karachi	Quetta and Kalat	
1965	407.0	38.2	121.0	4.8	150.0
1966	482.0	64.4	140.0	6.5	182.0
1967	572.0	102.9	159.0	8.3	255.0
1968	666.0	139.2	186.5	9.9	343.0
1969	774.0	159.8	235.0	11.8	413.0
1970	871.0	177.1	321.0	13.4	498.0

Estimates of Long Term Demands

Various methods have been used to determine the long term requirements of a developing country. Essentially, they involve (i) correlation of electrical consumption with GNP, industrial indices, etc.; (ii) extrapolation from past trends, with adjustments for the future; and (iii) inferences from development in some other country similarly situated. A number of studies have disclosed that there is a definite relationship between the GNP of a country and the per capita electrical consumption. For Pakistan, data is not available over a sufficiently long period to establish a precise quantitative relationship. Nevertheless, the available statistics do disclose a close inter-dependence of GNP and per capita electric consumption. We find that over the first and second plan periods (1955-65) electrical consumption registered an annual rate of increase of 6.16 per cent while the GNP increased at an annual rate of 3.6 per cent.

Projections of electrical energy demand have been made on a provincial as well as nation-wide basis. Tables 2 and 3 give the electrical energy consumption by the plan periods.

TABLE 2

Gross Domestic Product and Electrical Energy Consumption

Year	East Pakistan			West Pakistan		
	Gross Domestic Product million Rs. (1959-60 prices)	Electric Energy generation: Total TWh	Electric Energy generation: Per Capita kwh[1]	Gross Domestic Product million Rs. (1959-60 prices)	Electricity Energy generation: Total TWh	Electricity Energy generation: Per Capita kwh
1960	14,945	0.44	8.2	16,494	1.62	36.0
1965	19,455	0.83	13.6	21,070	3.61	71.0
1970	27,237	2.35	33.5	28,339	7.46	130.0
1975	40,583	7.17	89.6	38,258	14.35	220.0
1980	61,280	21.88	235.0	52,031	27.60	370.0
1985	90,694	64.20	620.0	72,323	53.20	645.0

* TWH = Terawatthour = 1 billion kilowatthours = 10^9 kwh.

TABLE 3

Gross National Product and Electric Energy Consumption

	1955	1960	1965	1970	1975	1980	1985
Gross national product at 1960 prices (million Rs.)	27,908	31,439	40,525	55,576	78,841	113,311	163,017
Gross electricity generation (TWh*)	0.957	2.062	4.440	9.807	21.522	49.486	117.400
Per Capita electric generation (kwh)	11.0	21.0	39.6	77.0	148.0	296.0	628.0

* TWH = Terewatthour = 1 billion kilowatthours = 10^9 kwh.

Some explanation shall be made here. The figures for 1955, 1960, and 1965 are the actuals. For subsequent periods the predicted rates of growth of electric energy on the basis of simple extrapolation of the past comparative rate would be somewhat different from what has been given in the tables. It had to be modified for two reasons. The first is that there have been scarcities or restrictions on demand and so the growth indicated may well represent an increase in the available supply rather than an increase in the demand itself. The second is that technical and technological advancement of the country in later Plan periods may favour the achievement of the same rate of growth of GNP or GDP with less consumption of electrical energy.

The tables disclose that electrical energy consumption in Pakistan in 1965 was 4.44 billion kilowatthours. But by 1985 it should rise to 117.40 billion units, an increase of nearly 113 billion units. East Pakistan, which has a smaller base, will have an accelerated rate of growth in the fifth and Sixth Plan periods to achieve a balance with West Pakistan.

The energy requirements in Table 2 are reduced into installed power requirements by assuming certain load and capacity factors. As a result of carrying out this exercise the estimated total installed capacity will be as given in Table 4, where the figures for 1955, 1960, and 1965 are the actuals.

TABLE 4

Total Electric Power Capacity (1955-1985)

Megawatts (106 kw)

Year	1955	1960	1965	1970	1975	1980	1985
East Pakistan	0.07	0.18	0.30	0.83	2.30	6.00	15.20
West Pakistan	0.27	0.70	1.13	2.06	4.00	7.50	12.70
Whole country	0.34	0.88	1.43	2.89	6.30	13.50	27.90

RESOURCES

The energy resources needed to meet electrical power requirements will have to come from coal, gas, oil, fissionable materials, and falling water.

As far as is known presently, the primary energy resources are inadequate and unevenly distributed. Pakistan has negligible oil reserves and limited coal deposits. The gas reserves are sizable, although not plentiful. The hydro resources are primarily located in the north of the Indus basin. Table 5 summarises the present position of coal, gas and peat.

TABLE 5

Primary Energy Resources of Pakistan

Resource	East Pakistan	West Pakistan
Coal (million tons)	—	335
Gas (million million cubic feet)	3.51	14.33
Peat (million tons)	210	—

Estimates show that, after making allowance for other needs, about 2.5 million kw in West Pakistan and only 0.5 million kw in East Pakistan can be based on gas. Coal may likewise sustain about 3.5 million kw in East Pakistan and 2.2 million kw in West Pakistan. East Pakistan in addition can make use of peat to develop about 0.5 million kw.

East Pakistan is largely a flat delta area and has a negligible hydro potential, only some 200 MW. Exact figures of the hydro potential of West Pakistan are not known. They are quite substantial. Our estimate is that by 1985 5 million kw can be economically harnessed.

After allowing for some power based on oil obtained from the local refineries, we find that for the remaining requirements we will have to depend upon nuclear fuel plants. By the beginning of the Fourth Plan period we expect about 250 megawatts of power generated by fissionable meterials.

It is estimated that Rs. 8,000 crores are necessary to meet the capital investment requirement over the period 1965-85.

Urbanization and Electric Power Supply

M. Masihuddin

One of the basic causes of urbanization is the setting up of industries which attract under-employed rural population to the cities for employment. The growth of population and the upsurge of industrial activity has resulted in an unprecedented increase in power demand. A typical example of this phenomenon is Karachi. The maximum demand which stood at less than 10 MW in 1948 increased to 25 MW in 1965, more than doubled during the First Plan to 53 MW by 1960, again more than doubled during the Second Plan to 122 MW by 1965, and in the light of developments envisaged during the Third Five-Year Plan period is likely to be of the order of 320 MW by 1970. Consequently, the public utility in Karachi, Karachi Electric Supply Corporation, has been engaged in adding generating capacity to the system from time to time. It added 15 MW during 1948-55, 30 MW during 1955-60, 214 MW during 1960-65, and at present plans are underway to add 120 MW of conventional power, and 132 MW of nuclear power.

In addition, the construction of a high voltage transmission line will be undertaken during the current plan period to bring additional power from the Mari Power Station to Karachi.

The same story can be repeated in other cities in West Pakistan where small towns of yester years with demands of few hundred kilowatts have turned into thriving industrial cities with power demand in thousands of kilowatts.

At this stage the thought may enter ones mind: what is the big problem? All that is required is proper planning. As industrialization and attended urbanization takes place one should be able to predict the anticipated increase in power demand ahead of time and to add generation and distribution facilities to cater for the increase in demand. After all it is the same story for housing, water supply, transport, etc.

The problem is not so simple. There are a number of limitations to proper planning. For one thing the power industry is a highly capital intensive industry. Also it requires especialized technical know-how. Unfortunately, we belong to what is commonly referred to as the under-developed world

with scarcity of technical know-how and above all financial resources, particularly foreign exchange for the purchase of goods and services. So the planner has the difficult job of making the best possible use of the limited resources, and then cut the coat according to cloth. Sometimes quality of service has to be sacrificed on the alter of quantity *i.e.* in order to provide power service to large number of new consumers improvement of quality to existing consumers has to be delayed. Notable example is that of the West Pakistan WAPDA power service in major cities of Lahore, Lyallpur, etc., where 300,000 new connections were given—a number equal to the number of consumers in 1960 during the past five years. At the same time quality of service generally deteriorated with frequent outrages, voltage variations, etc., which will be discussed in more detail subsequently in this paper.

Growth and Forecasting

As discussed earlier, the demand for electrical energy increases for a number of reasons:

1. Increase in population;
2. Industrialization;
3. Improvement in the living conditions of the inhabitants due to the general economic development.

Items (1) and (3) are directly related to house-hold consumption and (2) to industrial and general services consumption. Although it is possible to predict to a reasonable degree the increase in population, the prediction in respect of item two is rather difficult because of the possibility of abrupt changes in future industrial development. About ten years ago a steel mill was planned to be set up in Multan, the demand for which alone was more than three times the demand for the entire city of Multan. A big power station was planned and executed but the steel mill never materialised. The result was that the station for a number of years was under-utilized until it was connected to West Pakistan Grid.

At the same time, the planner has to be prepared for unforeseen development which are common in underdeveloped economies, where development largely depends on the availability of external financing. Then there is the third item which relates to the improvement in living conditions of the urbanized population. One could notice the emergence of a small rich class in practically all the major cities of West Pakistan who have the means of living in air-conditioned houses. Those living in the localities of PECHS in Karachi or Gulberg in Lahore must have observed the voltage fluctuation,

i.e. lights becoming bright and dim alternately, particularly during the peak load hours in the evening. This is because of the air-conditioners installed by some people in their houses. This improvement in living condition of the people also poses a problem to the power utility which has to predict the growth in demand on this account and is required to make satisfactory arrangement for catering for it.

The classic approach to the problem of demand projections in urban areas is by way of direct inquiry of the present or potential consumers in the area. Direct inquiry among the consumers include the following:

(i) Inquiries made of local or municipal authorities, like the Karachi Development Authority, Lahore Improvement Trust, Multan Improvement Trust in regard to current urbanization and housing programmes;

(ii) Inquiries made of planning and investment promotion organizations with respect to the proposed installation of industrial establishments;

(iii) Qualification of the population by income;

(iv) Inquiries among the actual leading industries in regard to their current plans.

PROBLEMS OF SUPPLY

Once the exercise of forecasting is complete, the next step is the supply of electricity to meet the projected demand which involves both generation as well as distribution. To begin with I might as well tell you that inspite of all the headaches it entails the business of power utilities in urbanized areas is far more lucrative than that of those utilities who have the responsibility of supplying power in rural areas where the density of demand is low. There are a number of ways by which utilities operating purely in urbanized areas cut down their operating costs per unit of electricity supplied.

In respect of generation with the progress of time rapid growth of demand lends itself to installation of bigger and economically sized units; so that the unit cost of generation that is amount of money required to generate one unit of electricity can be progressively reduced. Here again, I will quote the example of Karachi where initially 5,000 kw units were installed in 1953 which had relatively high cost of generation followed by 15,000 kw units in 1956/57, 33,000 kw in 1962, and 66,000 kw in 1965. As the size of the units increased, the operating cost paisa per unit decreased from about 18 paisas in 1947-48 to nearly three paisas per unit from the recently commissioned

66,000 kw units. This was the bright side of the story. Let us now look at the darker side. Addition of the generation facilities alone entailed a capital investment of nearly Rs. 26.0 crores. Nearly seventy per cent of this amount had to come from abroad in the form of plant and machinery. Fortunately for the Karachi Electric Supply Corporation, their projects were readily picked up by aid giving agencies at attractive terms of repayment otherwise it would have been very difficult to finance the projects from the country's own meagre financial resources.

The rate of interest was nominal only (three-quarter of one per cent), and repayment has been easy due to increasing sales and revenues. Let us now, examine what would have happened in case the rate of interest was higher say 5-6 per cent. This would have made not only the repayment difficult but also would have off-set the advantage of installing bigger sets and the consequent reduction in generation costs.

So far I have been talking about the generation aspect. Let us now examine the effects of urbanization on transmission and distribution aspects. The transmission and distribution facilities have to be continuously augmented to cope with the emergence of demand in the new areas of the cities which are ear-marked for the development of industry and new satellite towns which are built to house the increase in population. At the same time, existing distribution network has to be renovated to cater for the increase in the density of the demand in the existing area of distribution. Capital investment for distribution is as intensive as in the case of generation. In the case of Karachi, capital cost of the network from 1948 to 1962 alone was Rs. 9 crores and capital cost for distribution of one kw of power was about Rs. 650/- on an average. Probably by now it is clearly stated that the power industry is one of the most heavy of the capital intensive industries.

Let us now examine some specific problems which were mentioned earlier with regard to the quality of service in urbanized areas. Initially, as the population increases and industries are set up, the public utility, unable to cope with the increasing demand, is liable to sacrifice quality of service in order to provide service to as many consumers as is possible. Here is the same story as that of a milkman who on "Eid Days" when the demand increased usually resorted to adulteration. In the same way the utility company, particularly in an under-developed economy where ready finances are not available and plant and machinery have to be imported from abroad for installation, is sometimes forced to resort to the same technique. What is done here is that the same generator is made to operate at lower voltage or less frequency so that it can give more current. This way larger number of consumers can be accommodated, but with poor quality of electric power. Please do not think that I am trying to justify the cause of poor quality of

service in urbanized areas, but I am simply mentioning to you the steps public utility has to take in an underdeveloped economy in order to decrease the number of 'have-nots', till such time as it can muster enough finances for taking up increased demand.

Still there is always the problem of pilferage or theft of power from the 'have-nots' and sometimes even from the 'haves'. There are numerous instances where light and fans (for which the tariff is higher than that for power appliances) are operated from power mains. It has also been noticed that many 'have-nots' have tried to pilfer power by tapping over-head distribution lines, thereby not only endangering their own lives but also the lives and properties of their neighbours. All this warrants constant vigilance on the part of the utility which has to maintain a large fleet of inspectors and linesmen to prevent unauthorised connections and pilferages.

Electric Power for the Cities of West Pakistan

I. A. S. Bokhari

It is a well known fact that electricity today plays a vital role in the socio-economic development of any country. Its production and utilization in a particular country is, however, dependent upon a number of factors such as the economic condition of the people, the availability of natural resources like fossil fuels and hydro potential, and the state of exploitation of raw materials and minerals found therein. Before writing about the supply of electricity in the cities of West Pakistan, it is necessary to say something about this region's geographical and historical background.

West Pakistan spreads over an area of 3,10,403 square miles, most of which is formed by the Indus Valley. It has been the cradle of one of the oldest civilizations in the world. Archaeologists and historians trace the Indus Valley civilization to 4000 B.C. The mighty Indus, along which most of the population is inhabited, after emerging from the glaciers of the Himalayas flows through the main snowy hill ranges into the plains of West Pakistan. The area presents great variation in landscape. From the snow covered peaks in the North, the landscape slopes down southwards. The Indus Valley at the foot hills in the North is green and full of orchards, while the plains are wide expanse of wheat and irrigated by a vast network of canals. In the South-West are found mostly barren and sunburnt hills. According to the geological survey reports, the country has a large amount of untapped resources of minerals and fuels and a preliminary estimate puts the hydro electric potential at 30 million KW. Most of the Province has a cool and pleasant climate from November to March. The average rainfall in the areas of Sargodha, Lahore and Rawalpindi Divisions is about 10 to 15 inches. In the areas of Bahawalpur, Khairpur and Hyderabad Divisions, the rainfall is scarce and in the Quetta and Kalat Divisions, it is practically nil. There are eight large cities: Karachi, Lahore, Hyderabad, Lyallpur, Multan, Rawalpindi, Peshawar and Gujranwala which have population ranging from two hundred thousand to two million. There are thirteen cities which have population ranging from fifty thousand to two hundred thousand. Some of the important ones are Quetta, Sialkot, Sargodha, Sukkur, Bahawalpur, Montgomery, and Mardan. There are two hundred and seventy-two towns

which have population ranging from ten thousand to fifty thousand. A few of the important ones are Wazirabd, Sheikhupura, Bannu, Nawabshah, Rahimyar Khan, Okara and Jhang. By definition any place that has a Corporation, a Municipal Committee or a Town Committee to manage its affairs is classified as a town or city.

Previously West Pakistan was divided into small provinces and states. The provinces were comparatively more developed. These smaller units were the creation of the foreign rulers and had a very poor economy prior to Independence in 1947. There were only a few towns in each of the units such as the Divisional and District headquarters of the civil administration. There were also a few *mandi* towns where agricultural produce of the country was purchased and sold. There was hardly any industry.

The generation of electrical power and its utilization in different ways has been known for more than a century, but it appeared for the first time in the area which now constitutes West Pakistan only in 1913 when a diesel generating station was established in Lahore by a private Electric Supply Company under a licence from the Government. Karachi followed in 1915, Hyderabad in 1919, Multan in 1922, Larkana in 1929, Peshawar in 1930. Later on other important cities were electrified. The principal use of the electricity at that time was lighting and heating. As the time passed and more and more uses of electricity were known, its application was extended to other spheres of life. Therefore, in order to get a proper view of the impact of electric supply facilities in cities of West Pakistan, it is necessary to divide the history from 1913 to 1966 into three periods; *i.e.* first from 1913 to 1930, second from 1930 to 1947, and third from 1947 to 1966.

Prior to 1930 the economy of the area was mainly agricultural. There was little industry. Electrical supply systems were established by private electric supply companies in a few large cities with the sole object of providing electric lights. Its applications susbsequently extended to small engineering, cotton ginning and flour mills. Consequently, there was no large scale development of power during this period. The number of cities electrified in 1930 was only sixteen.

As the population increased, this caused an increased pressure on the agricultural economy. It was, therefore, quite natural that some population which found it increasingly difficult to earn a reasonable livelihood out of agriculture had to find some other ways of earning outside the scope of village life. Initially, the raw produce of the agricultural lands was removed to such places as had larger population and where quicker disposal was possible. Some raw materials could be transformed into goods like

cotton cloth, leather articles, and oil. This gave impetus to concentration of people in urban areas which later on assumed the position of *mandi* towns. Some of these became cities. These cities offered varied opportunities and attracted more people from the nearby villages. Thus, a stream of migration started from the rural areas to urban side. Electricity played a very vital role in this development as it could now be put to several uses in the civic life such as lighting, heating, cooking, water supply, cinemas, radios and hospitals. By then application of electric power in the industry had been widely known in the world and attention was given to the establishment of small industries mostly concerned with the processing of the agricultural produce. The Governments of old Punjab and North-West Frontier Province subsequently became aware of the need to produce electrical power for agricultural and industrial development.

In December, 1925, the Government of the Punjab created an Electricity Department and undertook the execution of Uhl River Hydro Electric Project which has an installed capacity of 48,000 KW. The station was commissioned in 1933. Initially some towns of the undivided Punjab were electrified out of which only a few, namely, Lahore, Sheikhupura, Ghuharkana, Mohlan, Jaranwala, Lyallpur and Kasur are now in Pakistan. The power produced by the Uhl River was transmitted to the above towns through a net-work of 132 and 66 KV lines. Thus, a beginning had been made in creating an integrated grid system in the Punjab. Similarly in 1935, the Government of Northwest Frontier Province created an Electricity Department to build the Malakand Hydro Electric Scheme on the Upper Swat Canal. A Hydro Electric Station of 9600 KW was installed at Jabban. The station was commissioned in 1938 alongwith 70 miles of 66 kv Transmission Lines and four Grid Stations at Mardan, Nowshera, Charsadda and Peshawar. The former Sind area had besides Karachi no major power generating stations except one at Hyderabad installed by the Hyderabad Electric Supply Undertaking. During the Second World War a few industries had to be set up to further the defence efforts which later on were switched over to civilian use and it marked the beginning of the small scale industries such as sports goods, cutlery, toys etc. More towns installed diesel generating units to run ice factories, oil mills etc. The total number of towns and cities electrified in West Pakistan at the time of Independence was one hundred and one.

With Independence mass migration of Muslims took place from India to West Pakistan, especially to the cities. This caused great pressure on the urban economy. Consumer goods which were largely imported or previously produced by the small industries in India were lost. Hence, the immediate need to establish similar industries in West Pakistan to fill the gap. This called for a dynamic approach to the electrification of the

urban areas in West Pakistan. Until 1950 all the efforts were directed towards the rehabilitation of Electric Supply Undertakings; most of which had been abandoned by the non-muslim owners at the time of Independence and left in poor shape. At the same time Provinces formulated schemes to meet the immediate requirements of power in already electrified towns and made special efforts to procure and install additional generating units. In the Punjab, frantic efforts were made to complete Rasul Hydel Project (22,000 KW); the planning of which had been done just prior to Independence and for which materials had already been ordered. The station was completed in April, 1952. The generating station at Karachi was also increased by 30,000 KW.

By then it had become clear that in order to improve the economic conditions of the country and to raise the standard of living of its people, it was necessary to lunch a programme of agricultural and industrial development. Electrical power was to play a vital role in this development. The First Five Year Development Plan envisaged an expenditure of Rs. 44 crores on power which represented about 20% of the total outlay on development in the public sector in West Pakistan. It was planned to extend the Malakand Hydro-Electric Project by 10,000 KW and build two new generating stations: one of 20,000 KW capacity at Dargai and other 4000 KW capacity at Kurram Garhi in the old N.W.F.P. In the old Punjab it was decided to build three Hydel Stations at Chichoki Mallian, Shadiwal and Gujranwala (aggregate capacity 36,000 KW) and to establish a station at Lyallpur with a diesel aggreate capacity of 8000 KW and a steam aggregate of 14,000 KW. Another Thermal Station was to be built at Montgomery with an aggregate capacity of 8500 KW. In old Sind 15,000 KW Thermal units were ordered for Hyderabad and Karachi was to have 66,000 KW additional thermal generation. It was hoped that when these schemes were completed, these would provide adequate power to meet the needs of the Province until 1960. It was realized that power needs in the immediate future *i.e.* 1960 onward were great and if those were to be met, some major generating stations must be established. It was, therefore, decided that a Hydro Electric Scheme of initial capacity of 160,000 KW be constructed at Warsak and a Thermal Station of capacity 130,000 KW using the newly discovered Sui Gas would be constructed at Multan. These stations should be inter-connected by Primary Transmission Lines and linked with the already existing Grid System in the old Punjab and N.W.F.P. Since these major jobs could not be accomplished by the Electricity Department of the Provincial Government, the Government of Pakistan undertook to construct the Warsak Scheme and entrusted the latter two schemes, namely, the Multan Thermal Station and the West Pakistan High Tension Grid to the Pakistan Industrial Development Corporation.

During this time a major change had occurred in the political set-up of West Pakistan. All the Provinces and states had been integrated into one unit. It now became possible for a single Government to plan and execute an electrical power system for the entire province. To help in the achievement of this objective, an autonomous body, Water and Power Development Authority (WAPDA), was created in 1958 and was entrusted with the work of unified development of the water and power resources of West Pakistan. The different agencies engaged in the development of electricity were transferred to WAPDA in early 1959. The Authority pushed the schemes already under construction and instituted a comprehensive Power market survey to establish the power needs for the next 10, 15, and 25 years. The data obtained was utilized in the Second Five Year Plan and contributed in formulating the Third Five Year Plan. Concurrently work was started on preparing a Master Plan for the next 15 and 25 years.

The objectives of the Second Five Year Plan on electrical power development were to provide power cheaply and abundantly in order to accelerate and strengthen the agricultural and industrial development. It encompassed the following:

(*i*) to instal additional generating capacity to meet increased power demand during the plan period,

(*ii*) to provide transmission and distribution facilities to meet the growing and diverse demand over large area, and

(*iii*) to make a modest beginning with electrification of rural areas.

High priority was given to the development of power so as to spread its benefits to as large an area as possible. During this plan, the Multan Station was extended by 130,000 KW; Sukkur had a station of 25,000 KW, Hyderabad was extended by 15,000 KW, had a station of 15,000 KW, and work had started on Hyderabad Extension 23,000 KW, Sukkur Extension 25,000 KW and Mangla Hydro Electric 300,000 KW. Karachi had 16,000 KW diesel and 136,000 KW steam generation. It was hoped that with the completion of all these schemes it would be possible to meet the needs of the people until 1970.

As the implementation of the Second Five-Year Plan started, it was observed that development was going on at a much faster pace than it was previously envisaged. Some adjustments were made during the Plan to provide for additional generation to meet the larger needs. It also gave a clue to even more dynamic approach in preparation of the Third Five-Year Plan.

The total outlay on power development during the Second Five Year Plan was Rs. 120 crores and represented approximately 26% of the total investment in the public sector.

The Third Five Year Plan power development is almost twice as large as that of the Second Plan. It was decided to build a number of additional generation schemes to meet the needs until 1975. These include Extension of Mangla Hydro Electric, 300,000 KW, Mari Thermal Scheme using the newly discovered gas at Mari 400,000 KW, Mobile Gas Turbines Units 100,000 KW and Extension of "C" Station at Karachi 120,000 KW. The work on Tarbela Dam which will be capable of producing 2.1 million KW and where initially four machines of 175,000 KW each will be installed will be started during this plan. A nuclear power plant of capacity 120,000 KW has also been authorized for Karachi. Some of the isolated places which are not within the economic reach of the Grid will continue to receive supply through local diesel generating units. The schemes of the major transmission and distribution lines to convey power from the generating plants to the ultimate users are also included in the Plan. The objectives of the Third Plan go even farther than the Second Plan and give emphasis on the creation of heavy industries. Efforts also have been given to increasing the fight of the menace of water-logging and salinity. A section of the Pakistan Western Railways Lahore-Khanewal, is to be electrified. There are definite plans to set up more fertilizer factories to help in becoming self-sufficient in food. Some steel mills and heavy mechanical and electrical complexes are to be established to decrease dependence upon foreign sources. All this will bring tremendous pressure on the towns and cities of Pakistan, and the electrical supply will have to extend on a much larger scale to achieve the desired objectives. It is expected that by 1970 two hundred and eighty towns will have been electrified and by 1975 there will be no town left without electricity. At this point it would be interesting to look at some statistics that concern the electricity supply in West Pakistan. These are briefly given as under:

	1930	1947	1965
1. Number of Cities/Towns electrified	16	101	235
2. Installed capacity (excluding private generation). (KW) ...	8000	44,000	8,51,000
3. Maximum demand (KW) ...	3500	35,000	6,50,000
4. Number of consumers ...	15,300	89,000	9,70,802
5. Per capita generation of electricity (KWH)	1	5	77
6. Capital Investment in Power industry (crores of rupees) ...	—	3.5	248.00

It may be seen from the above that although electricity was made available to a few privileged towns for limited use prior to 1947 yet real progress was made to bring this facility to a larger number of towns only after Independence. Until 1955, energies were directed towards the rehabilitation of the existing supply systems and the creation of new sources to meet the immediate needs. In the following decade, particularly during the Second Five Year Plan, large scale development of power took place and infra-structure was developed for uniform and coordinated future development. The rate of increase of power demand had been more than 20% per annum.

It may be mentioned here that electricity supply received the greatest impact of urbanization in West Pakistan. This industry had to pass through a very difficult stage during the past ten years and is still fighting to keep up with the development taking place in other sectors of the economy. The country depended upon foreign assistance for the purchase of plant and equipment required in the generation, transmission and distribution of power. Because of the dynamic policy of the Government, substantial progress has been made in recent years in the manufacture of electrical stores such as poles, conductors switch-gear, and transformers in the country; yet a large number of other items such as generators, extra high voltage transformers and switch-gear still have to be imported. Delays have sometimes occurred in the completion of new schemes because of the long negotiations of foreign loans for the procurement of electrical plant and equipment. Pakistan has limited resources of its own and these have to be evenly spread in all sectors of the economy for the overall development of the country. Therefore, until the economy becomes self generating the race between supply and demand of power would continue. It is, however, encouraging to note that electrification of cities and towns in West Pakistan during the past 15 years has proceeded at a commendable rate.

Before concluding I would like to mention that besides the cities and towns, as of June 1966, 2,050 villages have been electrified under a programme of rural electrification. It can be said with confidence that in due course of time when cottage industries develop in our villages and communication facilities improve these will begin to grow into small towns
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Natural Gas Supply for Karachi

T. R. Sharique

Introduction

Natural gas today has become an integral part of our every day life. Many things we see and consume are in one form or the other the products of natural gas.

In Pakistan natural gas may not have found as many uses as in more industrialized countries. Nevertheless, natural gas, has helped produce many items for our daily consumption. The breakfast we had this morning was prepared on it. The textile fabrics we are wearing gas has helped in their production. The cement used in the construction of this room where we are sitting was partly produced by natural gas. The electricity we are consuming was generated by gas-driven turbines.

Natural gas, although many many centuries old, is very new to us in Pakistan. It is produced in large quantities both in East and West Pakistan. Natural gas distributed in Karachi is produced at Sui about 347 miles north of this metropolis.

Historical Perspective and the Set up of the Sui Gas Industry

The natural gas supplied in Karachi was discovered in 1952 at Sui by Pakistan Petroleum Limited. Between 1952 and 1955 the main transmission line from Sui to Karachi was laid and it was only in 1955 when the supply of gas in Karachi began.

The Gas Industry consists of three components: (*i*) the producers, (*ii*) the transmitters, and (*iii*) the distributors. The Pakistan Petroleum Limited is the producer of Sui gas at the Sui field. It extracts gas from deep wells and passes it on to the Sui Gas Transmission Company Limited which as the transmitter purifies it and brings it to Karachi, through a network of 347 mile-long pipeline. The Karachi Gas Company Limited then takes it over and distributes it throughout the Karachi area.

Karachi Gas Company as the Distributors

The Karachi Gas Company Limited is public limited company responsible for the distribution of natural (Sui) gas in the Karachi area. It was incorporated on August 17, 1955 under the Companies Act, 1913.

Karachi Gas Company Limited is a 100% Pakistani agency with a total paid up capital of Rs. 15 lakhs out of which 100 lakhs were subscribed by the public and the remaining Rs. 50 lakhs by the West Pakistan Industrial Development Corporation.

Karachi Gas Company buys gas from Sui Gas Transmission Company at its terminal on Country Club Road and distributes it throughout Karachi.

Since its inception, during the past 11 years, the company, with total capital investment of Rs. 4.75 crores, has laid a net work of approximately 432 miles of pipeline, ranging from 20″ diameter to 1″ diameter. This net work is at present feeding gas to 20,564 consumers, 457 industrial, 1275 commercial, and 18832 domestic consumers. The number of premises on gas at the end of the last financial year of the company on August 31, 1966 was 20,028. Until recently, the annual increase in company's distribution mains was approximately 70 miles and approximately 300 consumers were being added every month. Lately, however, due to the difficulties of foreign exchange, the details of which shall be mentioned later, extension at this rate has become a difficult task.

DISTRIBUTION SYSTEM OF THE COMPANY

The point of origin of the distribution system of Karachi Gas Company is the Sui Gas Transmission Company terminal station at Country Club Road. From this point onwards the company's distribution net work consists of 23 miles of 20″ diameter and 30 miles of 16″ diameter supply mains operating at a pressure of approximately 150 pounds per square inch and 379 miles of distribution feeder mains and services operating at a pressure ranging between 40 and 60 pounds per square inch.

Initially, two major supply lines of 16″ diameter were laid from the terminal at Country Club Road—one, which is known as Karachi Main, was laid to feed gas to the consumers particularly the industries, established in the western part of the city *i.e.* S.I.T.E. and West Wharf and the other supply line to provide gas to the industries in the Landhi Industrial Area. This is known as Landhi Main.

During the past 11 years distribution lines were laid from the Karachi Main to the older part of the city also to the newer housing areas like Nazimabad and various housing societies and to the industrial establishments in Valika Nagar. Landhi Main was further tapped to supply gas to the airport areas, Korangi Township and other areas lying in its vicinity.

Two years ago a third supply main of 74,000 feet of 20″ diameter was laid from Malir to Korangi to provide gas to Karachi Electric Supply

Corporation "C" Station located at Korangi. This line will also take care of future growth of the city in this area.

Of late, the city of Karachi has been expanding in the north—Schemes like KDA 24, 16 North Nazimabad and New Karachi Township are coming up rapidly. To cater for the growing needs in the North and also to provide greater flexibility in the distribution system therefore, a major distribution main—an 8 mile long 20" diameter pipe line was laid in the north of the city.

We in Karachi Gas Company are very sensitive to the requirements of uninterruptable supply of gas. In our planning for the distribution system due consideration is always given for the provision of such supply mains which could operate as alternative sources in the event of any major breakdown. If any breakdown occurs in the northern supply system, the southern supply mains should be able to provide gas at least to the vital installations in the north and *vice-versa*. To have this flexibility in the system and also to cater for the growing needs in the future, the company has plans to lay in the near future 2.5 miles of 20" diameter pipeline from Sui Gas Transmission Company terminal to Landhi Main and from this point onward 11 miles of 16" diameter supply line in the southern part of the city. The work on these projects will start during the next two or three months. With the completion of this project, a link between the northern and southern mains will be established and in case of breakdown of any one main supply of gas to vital industries would be possible to some extent.

DIFFICULTIES IN THE EXPANSION OF GAS SUPPLY

The achievements of the company briefly outlined above have not been all very easy. There are several factors which impede our rate of progress. Only two will be mentioned here. The first one is shortage of foreign exchange. The bulk of the items required for gas installations are imported. With the exception of low pressure smaller diameter pipes and few locally manufactured gas burning appliances practically all other items needed in our gas distributing system are imported.

The Company requires import licences worth Rs. 40 lakhs every year to meet its normal expansion programme and to maintain the existing system. Against this requirement prior to the Indo-Pak war the company was able to get import licences at an average of Rs. 25 lakh per year. After the war and until January-June, 1966 shipping period Company did not receive any licence except one of a meagre amount of Rs. 50,000. For the period July, 1966 to June, 1967, an allocation of only Rs. 14.09 lakhs has been made recently but the licences of this value have not yet been received. As a result of this paucity of import licences, the company had to stop all its

mains extension work in October, 1965. Even in such areas where mains existed the gas connections to individual consumers had to be stopped in May, 1966.

The stoppage of gas supply means greater use of imported fuel—more drain on our foreign exchange. This also means set back to the new industries which will not be able to commence their operations on account of no gas supply. This vicious circle does not stop here. Stoppage of gas supply entails risks of redundancy of labour not only in the gas distribution company but also in other companies engaged in the manufacture of gas appliances and mains laying contractual work.

The situation at present is that the work on further extensions and on new gas connections would continue to be stopped until new import licences are issued and the material to be imported against those licences is received by the company.

Too many authorities

Another big difficulty we face in the extension of our distribution system is presence of too many authorities. This problem is such which requires the attention of all connected with the problems of urbanization.

Perhaps one would be surprised to know that there are as many as 19 authorities in Karachi with whom we have to deal in order to get the permission for laying gas pipeline. These authorities include Karachi Development Authority, Karachi Municipal Corporation, Karachi Collectorate, Pakistan Public Works Department (Central and Provincial), Cantonment Board, Military Estates Society, Karachi Port Trust, Pakistan Western Railways, Sind Industrial Trading Estates, Landhi Industrial Trading Estates, Civil Aviation and numerous housing societies.

Before we lay our pipeline in any area we have to approach the authority or the authorities controlling that area. We submit our plans showing the route of our pipelines to these authorities for their approval. Certain authorities even insist on their prior approval of individual service connection to a household. Many times a plan has to be modified several times and its route determined over and over again just to meet the requirements of one authority or the other. This entails time consuming and frustrating delays in the execution of our projects.

Mere approval of the area controlling authorities is not enough. We have also to co-ordinate our plans with other public utilities like water, sewerage, telephones, electricity etc. We have to guard against the likelihood of any damage to other underground services while conducting our operations.

We have also to take care that we do not displease any member of Karachi Police with any traffic problem, when we are laying our mains in the roads and streets. All of this requires a great deal of planning and co-ordination with different authorities.

Few years ago we suggested to the Road Co-ordination Board the allocation of space for various underground services atleast in the newer areas if not in the older ones, which would make the task of all the utilities easy and would help reduce the confusion often created by the criss-crossing of various underground services. This proposal I hope will, in not too distant a future, receive the attention of all concerned.

While on the subject of co-ordination let me mention that very often we have to marry our mains and service extensions plans with the Road Building Programme of various authorities. Road Controlling authorities insist on getting their roads cut as in-frequently as possible. I don't blame them for it. But the difficulty with us is that with gas being the newest of the utilities to be introduced in our life, there is a demand for it in every part of the city. Our job does not finish at just having laid the mains in any area. Laying the main is the beginning of the trouble. Once the mains are laid requests from individual consumers start coming in. Mr. A wants gas in his house and six months later his next door neighbour Mr. B would like to have gas in his house. We as the gas company would like to meet the requests for gas connections whenever made to us, but it is really a difficult task for us to convince the gentleman sitting on the Road Controlling Authority Chair that it is not our fault that we have to dig the road again as Mr. B had made a request for gas connection six months after renovation of the road consequent to our having laid the pipeline there.

CONCLUSION

The supply of gas in Karachi is gradually increasing. Today we have 20,564 consumers with an average off take of over 65 mmcf per day; but keeping in mind the size of Karachi and its growth rate, we have still a long way to go. People have begun to realize the advantages of natural gas. They know that it is cheaper than any other fuel available in the country. It is easy and convenient to use. Just turn on the knob and there is all the fuel you need. It is clean and does not require any storage facilities. Even the risk of servants stealing the fuel or pinching the money from the kitty of purchases is gone. With all these obvious advantages, demand for gas has been increasing everyday. We as the distributors of natural gas, in spite of limitations imposed on us, are constantly endeavouring to meet —and with a broad smile.

Development of Atomic Energy in Pakistan

M. Anisur Rahman

Urbanization brings with it many problems—among these are water, power, and transport. Atomic Energy can help to solve the word's transport problems directly as in the case of nuclear powered ships and also indirectly by releasing fuel for other uses. Atomic Energy can also help to solve the water problems of coastal cities, where large scale nuclear power-cum-desalination plants can provide fresh water. The greatest promise from Atomic Energy catering for urban needs lies in the provision of the third and the most important of the essential commodities electrical power.

The importance of power can be judged from the fact that the per capita consumption of electricity is universally recognised as being the yardstick to measure the status of economic development of a country. There is a linear relationship between the per capita GNP of a country and its per capita consumption of electricity. This can again be seen in Table-I. In the United States the per capita consumption of power is 5340 units as compared to 2800 units in the United Kingdom, 1900 units in France, 1670 in Japan, 375 units in Brazil, 140 units in Turkey, 60 units in India, and 48 units in Pakistan. It is obvious from these figures that Pakistan stands at a very low rung of the ladder of economic development. Top priority must be given to the development of electric power generation.

Planning for power: Requirements and Resources

In planning for power generation, the potential demand for power must be established by taking into consideration a fairly long period of time, say 30 to 40 years. On the basis of a certain doubling period for per capita consumption and population growth rate it has been estimated that, at the turn of the present century, West Pakistan should have a per capita consumption of 1000 units (kwh) and a generating capacity of 32,000 MW at 50% plant factor while East Pakistan should have a per capita consumption of 500 units with a generating capacity of 16,500 MW at 50% plant factor. (See Appendices I and II). These figures are not very ambitious remembering that the per capita consumption of electricity in Japan, an Asian country, is 1670 units. To quote Dr. I. H. Usmani, Chairman of the Pakistan Atomic Energy Commission:

> If after the end of this century, we cannot be as economically developed as Japan of today, then (I think) we better fold up our economic development plans.

West Pakistan

Now we must see how much of the target generating capacity can be developed from our indigenous conventional power resources, considering East Pakistan and West Pakistan separately. West Pakistan is fortunate in having a big hydro-potential. Most of this potential is located in the inaccessible mountainous north and north-west regions. The technically harnessable hydro-potential of West Pakistan is about 10,000 MW; out of which about 550 MW is likely to be available by 1968. As hydro dams are multipurpose projects, and their construction involves a lot of time and money, it is not possible to harness more than 5,000 MW by the end of the Century.

The total reserves of coal in West Pakistan are estimated to be about 300 million tons. Assuming that the entire reserves can be mined and used for power generation, they can sustain a generating capacity of only 3,200 MW for 35 years. Assuming that 70% of coal will be used for power production, they can sustain a generating capacity of 2200 MWe for 35 years at 50% plant factor.

West Pakistan has some good deposits of natural gas. The reserves are estimated to be 14.5 million million cubic feet of which about 10 million million cubic feet are suitable for power production. Natural gas is a chemical raw material and its proper use should be for the production of fertilizers, plastics and other synthetics. Burning of gas for power generation is uneconomical since it utilises only 35% of the energy content of the gas, whereas in the production of fertilizers or in the manufacture of steel as much as 90% of its heat value can be recovered. Nevertheless if we may assume that the entire proven deposit of 10 million million cubic feet will be used for power generation, it can sustain a generating capacity of about 5,600 MW over the next 35 years. The total generating capacity available from natural gas in West Pakistan amounts to 8,000 MW.

The only other indigenous source of electric power is oil. Although we have until now invested nearly Rs. 40 crores in exploration, no new deposits have been discovered. The small existing deposits in the Potwar plateau hardly meet 15% of the country's requirements for transport. We may disregard oil as a source of indigenous power supply in Pakistan.

In sum, taking a liberal view of the exploitable hydro resources and conventional fuel reserves of West Pakistan, these, total 15,200 MW in terms of generating capicity. Comparing this with the potential demand of 32,000 MW by the year 2000 A.D., there is a gap of about 17,000 MW which must be bridged either by importing fuel or by resorting to nuclear power.

EAST PAKISTAN

The situation in East Pakistan is even more bleak. The terrain is very flat, the average slope from north to south being only about 1 ft. in 4 miles. The only major hydro-potential is in the Chittagong Hill Tracts where the Kaptai Dam on the Karnafuli river already constructed can give a generating capacity of 120 MW. An additional 40 MW of hydropower can perhaps be developed in the northern districts so that the total hydro-potential in East Pakistan can be in the neighbourhood of 200 MW.

The recently discovered coal reserves in the Bogra and Rajshahi districts of East Pakistan are estimated to be 500 million tons. These deposits occur at a depth of 2000—4000 ft. and present serious mining problems. Assuming that a heavy financial investment would be made and that the technical problems can be overcome, it has been estimated that the total availability of coal will not be more than 160 million tons. The entire amount can not be used for power generation, as coal is required for other purposes in East Pakistan. Even if 70% of the coal output is used for power generation, it can sustain a total generating capacity of only 1500 MW.

Natural gas so far discovered is confined to the eastern zone of the province and is estimated to be 3.92 million million cubic feet. The deposits at Chattak and Sylhet have been earmarked for the production of cement and fertilizers. The deposits at Rashidpur and Titas and other places are estimated to contain less than 3.00 million million cubic feet of gas. Assuming that, with further exploration, these reserves will be doubled by the year 2000 and that as much as 70 per cent of the total is used for power generation, the maximum power generating capacity from the gas deposits will be of the order of 2400 MW.

The total generating capacity which can be installed in East Pakistan using our conventional resources is about 4000 MW. This, when compared with the demand of 16000 MW at the turn of the Century, leaves a gap of 12,000 MW.

World Trend in Nuclear Power

The above analysis establishes case for nuclear power in Pakistan. The first nuclear power reactor in the world for generating electricity on a commercial scale was put into operation at Calder Hall in the U. K. in 1956. A year later the second nuclear power station started generation at Shipping port near Pittsburgh, U.S.A. During a span of ten years, nuclear power has reached technological maturity and sophistication. It has become economically competitive with power generated from conventional sources. The trend in the progress of nuclear power generation can be easily seen

from the growth of installed nuclear capacity of the world from only 5 MWe in 1955 to almost 10,000 MWe at the present. The world is now in a boom period of nuclear power production. This is manifested by the fact that in the current year alone orders for about 12,000 MWe worth of nuclear generating capacity have been placed in the U.S.A. It has been estimated by experts of the U.K. and the U.S.A. that the total world nuclear power capacity will be about 30,000 MW by 1970 and 350,000 MW by 1985. The cost economics of nuclear power are so favourable that in European and North American countries, which are far more richly endowed with natural power resources than developing countries, more than 50% of all additional generating capacity will be of nuclear origin. In the U.S.A., the nuclear power will account for about 50% of total generation in 1980 and 80% by the turn of the century. At present nuclear power reactors are in operation or under construction in 14 countries of the world and 24 more countries are in an advanced stage of planning for introducing nuclear power in the near future.

PAKISTAN EMBARKS ON NUCLEAR POWER PROGRAMME

Pakistan recognised as early as 1960 the importance of nuclear energy. Since then, the Pakistan Atomic Energy Commission has made intensive surveys and feasibility studies on the prospects of nuclear power. On the basis of these studies, it was decided to build two nuclear power stations and presently a long term programme for nuclear power generation is under preparation. Our first nuclear power station at Karachi will be operative in 1970 and a year or two later our second nuclear power station will be operative at Rooppur East Pakistan.

KARACHI NUCLEAR POWER PLANT: A CASE FOR URBAN POWER SUPPLY

As we all know that Karachi is Pakistan's chief sea port and the principal centre of trade, commerce and industry. It is also the main rail and air terminal. Since 1947 the population of Karachi has increased from 3,00,000 to over 2,500,000. During this period there has been a large industrial and commercial expansion. The oil refinery and other petro-chemical installations, and the planned 500,000 ton-per-year steel mill project indicate that this growth will continue. The rate of this industrial growth will depend primarily on the availability of low cost electric power.

Since 1951 the peak power demand in the Karachi area has been doubling every four years and the trend set during these years is likely to be maintained. A projection on this basis shows that by 1975 the demand for power in the Karachi area will be over 800 MW.

The only locally available fuel in the Karachi area is natural gas supplied from Sui through a 16 inch diameter pipe line. The area is served by the

Karachi Electric Supply Corporation, an isolated system which is likely to remain cut off, at least for the next few years, from the integrated grid system in the north of West Pakistan. The KESC has recently completed the installation of a gas fired station at Korangi which was designed to have an output of 132 MW. It was originally proposed that any power gaps that arise later will be met by expanding the station.

The existing 16" diameter gas pipe line from Sui has an unboosted potential of transmitting 90 million cu. ft. per day. By installing boosters this capacity can be uprated to around 140 million cu. ft. per day. At present about 35% of this gas is being utilised for power. As has been stated earlier, the proper use for natural gas is in the production of fertilizers, petrochemicals and in other synthetic industries. If the proportion of gas earmarked for power generation is to remain at 35% which it will have to unless it is to starve out the other industries, the demands of the Korangi Station will have to be met by the installation of boosting equipment. However, quite early in the life of the station it will become necessary to lay another extensive pipe line (costing approximately Rs. 13 crores) to supply the increased gas demand. It should be recognised, therefore, that the Korangi extensions will have to carry the financial burden imposed by the necessity of laying this extra gas pipe line.

It was an obvious conclusion that the Korangi extensions intended for the 1970's be replaced by the installation of a nuclear power station of 137 MW(e) output. The Canadian heavy water reactor concept was chosen for the station as this has certain advantages such as better cost economics and availability of the nuclear fuel. The station is now under construction at Paradise Point and will be operative in 1970.

The cost of the nuclear station will be about $65 million; of which $51 million will be in foreign exchange and the rest in local currency. This power station operating at 70% plant factor in the Karachi grid is expected to produce power at a cost of about 3½ paisas per unit which is approximately equal to the cost at which KESC is producing electricity at present from conventional sources.

The above analysis clearly establishes that atomic energy can already be fruitfully applied as a source of urban power supply. Added advantages will come from research and development work which is being carried on to evolve reactor concepts with even better and more attractive cost economics. Atomic energy promises to open up new vistas to progress and prosperity for various cities of Pakistan, as it will do for Karachi in the near future.

APPENDIX I

POTENTIAL POWER DEMAND IN WEST PAKISTAN

Year	Population (Million)	Per Capita Electricity Consumption (Kwh/year)	Total Consumption of Electricity (106 Kwh)	Estimated Generating capacity at 50% P. F. (KW)	Estimated Generating Capacity including 20% Reserves. (KW)
1965 ..	47.6*	80	3.800	870	1.040
1970 ..	53.6*	124	6.650	1.820	2.180
1975 ..	60.0	191	11.500	3.150	3.800
1980 ..	66.8	270	18.000	4.900	5.900
1985 ..	73.7	382	28.200	7.700	9.250
1990 ..	80.8	540	43.600	12.000	14.400
1995 ..	88.1	766	67.500	18.500	22.200
2000 ..	95.5	1000	97.500	26.600	32.000

ASSUMPTIONS

Rate of Growth :

A. Per Capita Consumption:	*1965-75*	*1975-85*	*1985-95*	*1995-2000*
(*i*) Period of doubling years	8	10	10	12
(*ii*) Percent increase per year	9.1	7.2	7.2	5.9

B. Population : ..	*1965-70*	*1970-75*	*1975-80*	*1980-85*	*1985-90*	*1990-95*	*1995-2000*	*2000-*
Percent growth per year†	2.4	2.27	2.14	2.01	1.88	1.75	1.62	1.49

* Source: Government of Pakistan (Census Commissioner).
† For population projection, annual growth rate is assumed to reduce uniformly from 2.4% (1965-70) to 1.5% by 2000 A.D.

APPENDIX II

POTENTIAL POWER DEMAND IN EAST PAKISTAN

Year	Population (Million)	Per Capita Electricity Cons sumption (Kwh/year)	Total Consumption of Electricity (106 Kwh)	Estimated Generating Capacity at 50% P.F. (MW)	Estimated Generating Capacity including 20% Reserves. (MW)
1965 ..	55.2*	16	880	260	310
1970 ..	60.7*	32	2.000	600	720
1975 ..	66.5	64	4.500	1.350	1.600
1980 ..	72.6	105	7.640	2.260	2.720
1985 ..	79.0	173	13.700	4.100	4.950
1990 ..	85.8	245	21.000	5.750	6.900
1995 ..	72.8	350	34.500	9.450	11.300
2000 ..	100.2	500	50.100	13.200	17.000

ASSUMPTIONS

Rate of Growth :

A. Per Capita Consumption :	*1865-75*	*1975-85*	*1985-95*	*1995-2000*
(*i*) Period of doubling years ..	5	7	10	10
(*ii*) Percent increase per year ..	14.9	10.4	7.2	7.2

B. Population :	*1965-70*	*1970-75*	*1975-80*	*1980-85*	*1985-90*	*1990-95*	*1995-2000*
Percent growth per year† ..	1.9	1.84	1.78	1.72	1.66	1.60	1.54

* Source: Government of Pakistan (census Commissioner)
† For Population Projection. annual growth rate is assumed to reduce uniformly from 1.9% (1965-70) to about 1.5% by 2000 A.D.

Problems of Transport in Urban Areas

Abdul Qayyum

Before independence, omnibus services operating in Pakistan were in the hands of small private operators. The operating conditions were unsatisfactory because of a lack of skill, planning, and paucity of capital. Amenities to public were largely ignored. The conditions prevailing would not permit organized development unless direct and complete control of Government was introduced. This was done first in the former Punjab in 1945 and later in 1947 in the former North West Frontier Province and Sind.

Road Transport Corporation runs the city services in Lahore, Rawalpindi, Islamabad, Lyallpur, Multan, Hyderabad, and Peshawar. A few services have also been provided in Gujrat, Jhang, and Sargodha. Out of a total fleet of R.T.C. 1,680 vehicles in 1966 nearly 560 are in urban areas: daily performing 48,024 miles and carrying 338,624 passengers. This number is considered extremely inadequate to meet the public requirements.

Because of rapid urbanization and expansions in industry, commerce and agriculture, the demand for transport will keep on increasing in all the cities. This means increased requirements of transport in cities already served by R.T.C. and fresh requirements in developing urban centres now emerging, hitherto not served. The transport requirements have become big enough to pose such thorny problems as congestion on the roads, rush hours, accidents, inadequacy of roads, and air-pollution. It is, therefore, necessary that a comprehensive scheme be evolved to clear traffic chaos on congested routes and heavily built up localities. It will be a major task because it will necessitate drastic changes in layout and designs of roads with provision for segregation of slow and fast vehicular traffic, standardization of a few means of road transport and eliminating the present bewildering variety, rationalising present *ad hoc* allocation of resources between private cars, taxis and public transport vehicles, between the private and the public sector of road transport, between various means of transport such as road, rail, air, and water, and between the transport and other sectors of national economy. The Corporation is trying to contribute its share of planning and effort in the proper directions.

During rush hours, in the large crowded cities, it is a difficult task to maintain a regular and safe flow of traffic: especially, where roads are narrow and carriage way capacity is limited.

This problem becomes more acute when private car users, rickshaws, and baby taxies cause unnecessary congestion at busy intersections and crossings during peak periods. Further, the delays get worse for want of regulatory controls and proper traffic signs and failure on the part of drivers to observe traffic rules. In some cases delays occur due to lack of knowledge of traffic rules and regulations on the part of users of roads. A comprehensive scheme must be chalked out for the education of road users.

The problem of rush hour arises from overlapping hours of work in industry, commerce, administration, and educational institutions. The peak hours rush is concentrated in relatively short periods in the mornings and afternoons. A large number of buses have to be pressed into service at these times. Even then a lot of over-loading occurs which causes delays, inconvenience to passengers, and damage to vehicles. Moreover, the utilization of this fleet during off periods presents a big problem, as these vehicles, if kept idle, make operation costs heavy and their retention becomes uneconomical. It is on account of this difficulty that the financial working of local services involves tight rope walking in its operations. In advanced countries in Europe and elsewhere, there are suburban trains, tube trains, in addition to buses. In our cities, due to lack of adequate resources, there are no such modes of transport which can relieve congestion on buses, particularly, during the peak period. What is needed to relieve the congestion of rush hours is staggering of timings in offices, educational institutions, etc.

A few specific problems which confront Road Transport Corporation and what the R.T.C. considers their most appropriate solutions will now be discussed.

1. It is simple economics that development in its ultimate analysis means men acting on materials. It is the urban areas where a large number of men are concentrated. Most of these work in offices or factories and whether from within the towns or adjoining suburbs, commute to and from their places of duty daily. It is evident that housing on the premises is out of question for a vast majority. It is also evident that all of them cannot own means of transport of their own. The importance of a good system of public transport in cities can, therefore, hardly be over-emphasised. To bring home its importance, a simple illustration may be given. If one man spends one extra hour every day because of want of an adequate system of public transport and there are seven thousand men in any area, enough man-hours are wasted to constitute about one whole valuable year of uninterrupted work.

2. In a developing country like Pakistan, with foreign exchange very scarce, alternative means of transport in and around the cities, such as the

underground railways, are virtually out of question because of heavy initial investment needed. Even for inter-city transport, transport by road is admittedly far more economical if the distances involved are about 300 miles or less, and in the case of goods heavy haulage is not involved. That is why the rail is yielding ground to road transport in many advanced countries. But in this country, unfortunately, partly for reasons of history, the allocation of the road transport sector continues to be disproportionately small. Because of not only the better economics but also its flexibility, road transport must attract greater investment than it has done hitherto.

3. In appreciating the gap between the requirements of urban areas and the actual size of the fleet, it has to be remembered that the requirements depend on density of traffic. The speed at which a bus will move determines the number of buses required to cope with the traffic on a particular route. Thus the width of roads and the presence of other animal driven or motor traffic on the same road are important factors. Unfortunately, at present our narrow roads are made further inadequate by the way they are being used. It is not unusual to find cars, taxis, rickshaws and buses moving on the same roads with tongas and cyclists. This reduces speed and rises the number of public service vehicles required.

4. What is far more important is that lack of planning about the use of public service vehicles is necessitating the import of an unduly large number of cars, taxis, rickshaws, etc. One double decker bus carries about one hundred persons. It is well known that private cars, taxis or rickshaws seldom carry the number according to their full capacity. It is, therefore, estimated that the load of a single double decker is carried by about sixty other vehicles. It is easy to imagine the traffic congestion which results when the same one hundred persons, who can be carried by one double decker, are in fact carried by cars, taxis and rickshaws totalling sixty. Thus, if recourse is taken to double decker buses, most of the congestion on our roads at present will disappear.

5. The motor vehicles other than the buses eat up space in another way also, *i.e.* parking. While public buses are constantly on the move, all the other motor vehicles need parking space and the frequency with which parking is done adds enormously to congestion.

6. The vehicular traffic has been rapidly increasing and will continue to do so. Today, the average effective speed of a bus operating in the heart of a city is less than 10 miles per hour. Any further increase of vehicular traffic on the limited road space is likely to bring the public transport to a snail's pace. We can eliminate private cars if for the more affluent and demanding section of the public, sufficient inducement by way of public transport is provided, which if not first class is tolerably comfortable and has quick enough frequency.

It is time that we provide bus services of this type. For the general public, we should introduce large capacity buses with maximum space for standing passengers at comparatively low fare. This measure alone will take away most of the congestion on roads and will be to the benefit of the private car and taxi users and the bus undertaking. It will also bring in further gain by way of faster traffic of the passengers at large. The undertaking will also benefit since more passengers will be carried for the same fleet thereby adding to its revenues. This will also reduce the cost of operation since the bus will do more trips and the crew will cover additional earning a mileage at low extra cost.

7. It is for the planners to keep in view the ease and economics of operations in resorting to public service buses, particularly double deckers. So far as R.T.C. is concerned, the solution is all too clear.

8. The fare structure at present is curiously designed and is creating some problems. It is fixed in terms of per passenger per mile recently converted into paisas. It is in force since 1952, and though there has been substantial rise in operational costs, wages, taxes, prices of spares, tyres, tubes, the fares have remained *stationary*. It is essential that some share of this additional burden is passed on to the passengers to enable the undertaking to keep its finances on an even keel and maintain the efficiency of the services. Moreover, we should also rationalize our fares in city operation. The existing fares are being charged on a mileage basis which involves unnecessarily lengthy calculations and in certain cases delays in the issue of passenger tickets. This can be avoided if fares are rationalized and rounded off to the digits of 10, 15, 25, etc.

9. A question is sometimes asked whether omni-bus operations in cities should be thrown open to competition by the private sector. Theoretical implications of mixing public and private competition apart, the practical considerations involved do not favour such a course in our present circumstances. It is common knowledge that the private sector works for profit alone and will not undertake any operations unless they promise handsome profit. The city operations cannot always generate such profit and in many cases any profit at all. The stop and go nature of city operations means greater wear and tear. The staff and overheads in cities also account for very heavy expenditure in a properly organised city service and maintenance has to be adjusted to the quick flow of traffic. If, therefore, the private sector comes forward to join city operations, it can hope to make profit only by neglecting essential requirements of passenger comfort. The recent example of Karachi where in 1966 out of 1,430 or so permits issued only 450 are being utilized.

10. My view, therefore, is that even if for reasons of policy, one would like to see the private sector competing with the public sector or replacing

it completely, the time is not yet ripe for permitting it. Unfortunately, the standards of operation of the private sector are so far below even what may be considered the minimum that permitting city operations by it would be inviting trouble for the general public. If it is at all considered necessary to let the private sector operate freely in urban areas, it will be most essential to first set up a machinery with statutory powers to lay down and enforce standards. Evidently any decent standards can be observed only by private operators of substantial means. The small fries would not be able to meet their overheads and still be solvent. Nor would they be able to provide the necessary staff with requisite qualifications and skill. The crying need of the day, therefore, is to set up such a body immediately and to make a beginning in the direction of setting up and enforcing adequate standards of operations of public services in the transport sector. When a professional class of managers in transport has as a result emerged in sufficient numbers and private organizations of the limited company types have been formed, it will be time to consider allowing competition between private and public sector, the latter being the only sufficiently organized machinery at present.

Planning for Urban Transportation

Mohammad Abdul Hakym

The problem of urban transportation is of a historic and world-wide nature. In the developed countries of the world, it is generally the proliferation of motorised vehicles combined with inadequate urban street capacity that creates problems; in under-developed countries, it is the shortage of both. Although the nature and scope of the problem differ from country to country, according to their history, resources and stage of economic development, the underlying causes are identical, namely, the heavy concentration of population and economic activity.

The problem in Pakistan is rendered particularly serious because of our relatively poor resource base to support the process of urbanization, which is not based entirely on industrialization but is largely the product of other factors like the exodus of unemployed people from rural to urban areas and overcrowding of displaced families in the urban centres. Urbanization, moreover, is greatly concentrated in a few large metropolitan areas, like Karachi, Lahore and Dacca. In fact, these three centres account for almost one-third of the total urban population of the country. These circumstances have led to the creation of extensive slums, and lack of sanitation, water supply, transportation facilities, recreation areas, schools, hospitals, so on. The cities are unable to raise enough resources from their poor inhabitants to supply these facilities.

The heavy concentration of population and economic activity entails intensive movements of goods and services in the urban area. Millions of people have to be fed and supplied and have to be moved between the place of residence and place of work. Besides, there are other demands relating to travel for recreation and social and cultural reasons. The greatest transport difficulties are, however, experienced in the mass movements between the place of residence and employment during the morning and evening rush hours. The separation between housing and work, combined with the growth of sprawling suburban areas, have accentuated the problem. During these hours extreme congestions result from heavy commuter traffic. The awful overcrowding in buses and transit railways makes it a human problem. The long queues at bus stops, and the people stuffed into buses and hanging precariously on the foot-boards are a pitiful sight.

The miseries of mass transportation in our metropolitan areas are a major factor which make living and working in cities an agonising experience.

From the social view-point, one wonders what tremendous amounts of energy and man-hours are lost in the daily process of commutation between home and work. While the passenger is the victim of these circumstances, the mass transit industry is faced with the problems of rising costs, financial difficulties and shortage of equipment, which in turn mean further deterioration in service.

Those who can afford to do without mass transit, and use private cars, have to face the ordeal of driving on extremely congested streets, which are generally narrow, poorly built and ill-maintained. In old-established cities, these facilities are proving absolutely inadequate to meet the growing needs of traffic, parking and terminal operations. In some urban areas, various segments of the road network happen to be under different administrative jurisdictions (like municipalities, city improvement trusts, cantonment boards, etc.) which creates almost insurmountable difficulties in developing and maintaining an adequate street system. Poor roads are a major cause of traffic bottlenecks, accidents, high cost of vehicle operation and low overall mobility. Frequently there are serious traffic jams, particularly during peak hours, which mean frustrating delays in movement, and poor utilisation of high-speed vehicles. The confusion is worse confounded by the presence of animal-drawn transports and other slow-moving vehicles on the same roads. Naturally, the rate of road accidents has been rising alarmingly.

As the trends indicate, the situation is likely to become more aggravated in the years ahead. The country's population is growing fast and in the next 20 years is expected to rise from 112 million to 190 million. During the same period, urban population will increase almost four-fold—from 16 million to 60 million—constituting nearly one-third of the total population by 1985.

The Need for Transport-oriented City Planning

Immense investments would obviously be required to provide the rapidly growing urban centres with adequate transportation facilities. But it must be realized that the objective cannot be achieved simply by increasing or improving the means of transport. Even in the United States, which is the wealthiest, the most motorized and, in terms of cross-country traffic, the most mobile nation of the world, the metropolitan areas are faced with grave transport problems. There, too, the city streets experience the intractable problem of congestion caused by the excessively large number of private automobiles, while the mass transit industries are decaying due to progressive loss of patronage to private transport. Here is a great lesson from the American experience which clearly indicates that the nature of the problem is such that it cannot be tackled unless attacked from all possible directions, in a well-planned way.

Obviously, the main difficulties arise from the conventional patterns of urban growth in which there is excessive crowding of population and economic activity in a small midtown area, and unorganised land uses create unnecessary and excessive transport needs. As one expert remarks: "The time has already come when we are wasting our substance by attempting to squeeze more cars, goods and people into smaller and smaller areas. The simple geometry of the Plan will surely defeat us no matter how long we postpone the day by ingenious engineering."[1] Considering the space constraints, it would clearly be futile to try to meet all the transport demand resulting from an unplanned growth of cities and suburbs. The need basically is to rationalise demand itself. This can be done mainly by planning and developing the urban areas in such a way as to minimise avoidable demand for transport.

Rational planning of urban land uses and proper zoning of metropolitan areas, with ceilings on size, can reduce transport demand to manageable proportions. The major element here would be the dispersal of industries and other economic activity in a multi-regional metropolis, so as to relate their location to housing projects with a view to minimizing the volumes of mass movement between residence and work and providing for a system of balanced regional flows. Fortunately,the modern motor transport technology has great potentialities as an instrument of dispersal. Unlike the inflexible railway lines, it can easily follow the dispersed pattern of urban growth into different regions, and can also effectively knit them together. In fact, this new potential makes the heavily concentrated pattern of city development an anachronism from the times preceding the advent of the flexible motor transport technology. The feasible trend now should be a multi-regional development of the city in which all the different regions are largely self-contained and are held together by arterial transport lines.

For such an approach to materialise, the fundamental need would be the creation of an effective machinery for a comprehensive planning of land uses and development of urban facilities. Thé dynamic potential of transportation should, of course, form the hard core of such comprehensive physical planning. Each community which aspires for a balanced urban growth should set up a physical planning agency which should be responsible for deciding on what lines the community would want to grow, and evolving comprehensive development plans encompassing location of housing, industries, and other economic and social activities on the basis of a coordinated circulatory system, comprising highways and streets, rapid rail transit, mass transportation by bus, and other modes of transport.

[1] G. H. Perkins, "The Regional City", in *The Future of Cities and Urban Redevelopment*, pp. 39.

The fact that Pakistan is still in the initial stages of development and urbanization means that there is ample scope for adopting measures that would obviate or mitigate urban transport problems resulting from irrational land uses and unplanned urban growth. Although some of our cities have experienced tremendous rates of growth, almost 85 per cent of the population is still living in approximately 100,000 villages. There are only 76 urban communities with a population of 25,000 or more, of which 45 are in the range of 25 thousand to 50 thousand people. It is here that transport-oriented city planning can be initiated to ensure the long run development of balanced cities, comprising several self-contained satellite or smaller towns, which would be capable of being provided with efficient circulatory systems.

At the moment, the Municipalities, Improvement Trusts or Development Authorities functioning in the urban areas are not equipped to undertake systematic city planning. The Third Five-Year Plan emphatically recommends that "the whole sphere of local planning and development should be carefully reviewed and steps taken to recondition or change the administrative machinery for more effective work and rational planning. The Trusts and Authorities should be properly integrated with the municipal governments and should be given complete responsibility for planning and development of the metropolitan and other urban areas".[1]

The physical planning programme of the Third Plan includes preparation of 45 Outline Plans, 23 Urban Development Plans, and five Regional Development Plans. In this context, it must be emphasized that, while preparing such Plans, the fundamental role of transport in shaping the future city cannot be overlooked without jeopardising the chance of creating cities which would have healthy circulatory systems and, hence, would be pleasant to live in. For only on the basis of the availability of a well-coordinated transport system will it be possible to plan land uses in such a way as to avoid over-concentration, congestion and blight. On this showing, therefore, the most fundamental need is to integrate the processes of city planning and transport planning through carefully devised administrative arrangements.

Improving Transportation in Old Cities

Besides ensuring a healthy and balanced growth for new urban areas, several measures will need to be taken to mitigate the problems of the cities that have already over-grown in a planless way. In many cases thay are likely to grow further. Karachi, for one, would keep growing in spite of the removal of the national capital from this extremely congested port city. The first important measure would, of course, be to regulate the pattern of land uses and suburban developments being planned for the future with an eye on the transportation aspect.

1 Government of Pakistan, Third Five Year Plan (1965—70). Pp. 364

The second important area concerns the need for relating the renewal and redevelopment of midtown areas to the practical possibilities of providing adequate transport to meet the anticipated traffic generation. We see that the central areas in old cities are undergoing a vertical redevelopment in the shape of larger and higher buildings. This process would obviously intensify the land uses and consequently traffic generation. The need here is to rationalise the future land use patterns and provision of necessary community services, including transport. Marketing out of open spaces, parks, etc., would, in this context, serve the dual purpose of improving the urban environments and checking congestion.

Relocation of railway lines and stations is often an event of great importance in urban redevelopment. It releases large areas of land for other purposes; removes one of major causes of midtown congestion; and shifts further growth of economic activity to new and more suitable locations where better terminal facilities can be provided. Two cases in point are the proposed relocation of the Karachi and Dacca railway stations, which have become inadequate to meet the greatly expanded needs of the over grown cities. In fact, the major advantage of the Karachi circular railway lies not in the circumferential movement of commuter traffic that if provides, but in the possibility of relocating the "central railway station" at the Country Club Road and the freight terminal at Khadda. These new facilities will have a great impact on the movement of goods and people in the metropolitan areas. In the physical planning of the areas surrounding the new railway locations, care should, of course, be taken to avoid emergence of congestion and blight in these areas in future. The Planning of the new areas should be based on a coordinated projection of land use patterns and of the various types of traffic that would be generated in the long run.

Some of the other important aspects in planning redevelopment relate to the need for providing adequate parking facilities in and around the commercial districts ; reservation of areas exclusively for pedestrians; and provision of what are called expressways or beltways to allow through traffic to by-pass the congested central districts.

All these requirements point to the imperative need for integrating transportation and city planning.

The Transport Complex

With respect to transport planning itself, the most fundamental needs again is to bring about a unified administrative machinery with the overall responsibility for creating a well-integrated urban transport system in which each method of transport plays the role for which it is best suited, and each is coordinated with the other in respect of development as well as

oepration. The greatest shortcoming at present is that different agencies are concerned with different segment of the urban transport complex, and no agency has the ultimate responsibility for providing a complete solution to the problem. A combination of different types of carriers makes the urban transport problem a complex affair, which cannot be tackled effectively in the absence of a unified approach to the planning, financing, administration and coordination of the transport system as a whole. The matter involves decision-making in different situations on issues like the roles of private *vs* public transport; bus *vs* rail transit; the problems of street congestions, traffic control, and parking; the scope for encouraging pedestrianism the handling of the peak-hour problem; relative development of various facilities and coordination among carriers; administrative, regulatory and financial arrangements to achieve the policy objectives, and so forth. A comprehensive policy has to be determined with a view to its effect on the transport system as a whole. And this can be accomplished only by a unified metropolitan transport authority in each metropolitan area.

The basic factors influencing overall policy decisions would be that the street capacities in the central city are strictly limited; that the most serious problems relate to the peak hours; that the resources to develop alternative transport systems are very limited; and that the available resources must be used judiciously to provide optimum mobility in each urban area. Each metropolitan transport authority must first of all decide what combination of the various modes of transport will most effectively meet the traffic needs of specified urban regions.

RAIL *vs* MOTOR TRANSPORT

The main area of decision-making will generally relate to the optimum ultilization of roads and road transport facilities. Rapid rail transit is an aspect restricted to some of the largest urban centres and does not have as many technological potentialities as motorized transport. Railway lines and terminals are generally located away from the population and employment centres, and are not easily accessible to large numbers of people. Railways are efficient mass carriers but their operation is inflexible in terms of space and time-frequencies. Motorized transport, on the other hand, can easily reach out to population centres in all directions and provides a ubiquitous service.

PRIVATE *vs* PUBLIC TRANSPORT

The basic issue in the context of road transport is the optimum utilization of the system comprising bus transit, private cars, trucks, other automotive vehicles, animal-drawn vehicles, bicycles and pedestrians—all vying for the limited street capacities.

One of the major questions to be decided in most congested metropolitan areas concerns the relative importance that should be given to the development of mass transit by bus and the more personalized travel by the car. Although the number of private automobiles in our country is low, it has shown very rapid growth in the larger metropolitan areas like Karachi, Lahore, Chittagong, and Dacca. The number of all types of motorized vehicles in the country increased from a little over 25,000 in 1947 to about 190,000 currently, and that of private cars from 12,000 to 75,000. Most of these vehicles are domiciled in urban areas and largely operate with reference to urban needs. Congestion has been increasing progressively, particularly during peak hours, and is likely to assume serious proportions in the coming years.

The quality of service provided by the car is, no doubt, much superior to that provided by mass transportation. The car is much more flexible, speedier and comfortable than the bus, and provides door to door service. The bus has fixed routes and time-schedules and involves the troubles of waiting and overcrowding. But then the car is a much more expensive method of transport, specially in terms of social costs, which should be a consideration of fundamental importance at our stage of economic development. Moreover, from the traffic standpoint, cars use much larger road capacity per passenger moved, and kerb-side parking consumes considerable street space, thus adding a great deal to the problem of congestion. If the purpose is to move the maximum number of people, rather than vehicles, on the narrow city streets, then emphasis must clearly be on the development of bus transit, and the growth of private transportation should be discouraged. The present stage of our economic development, the great paucity of foreign exchange resources, and the traffic needs of the masses also point to the desirability of according the highest priority to mass transit. Simultaneously, a policy directed towards making the ownership and operation of private automobiles more expensive would help reduce a diversion of patronage to mass transit, help reduce congestion on the streets, and release scarce resources for the development of transit services of a more widely acceptable standard.

Certain other opportunities may be available in the area of traffic management for reducing the extreme congestion in the central commercial districts of large metropolises. One such approach could be to encourage "pedestrianism" in highly congested areas. Bazars like Anarkali in Lahore and Bori Market in Karachi should be declared as exclusively pedestrian areas, where entry of vehicles of all types should be completely prohibited. In fact, congestion in future is likely to grow so acute that it may become necessary, at some time, to earmark large zones in the central city for pedestrian traffic, especially during rush hours. Vehicles will have to be left or parked at the

outskirts of the reserved areas, in which people will move about on foot. The idea is already being mooted in some western countries that private automobiles should not be allowed to enter the so-called downtown area at all; they should be parked at the periphery, from where passengers should ride mass transit to reach the downtown area. The sharply increasing number of private automobiles and other vehicles in some of our cities may some day necessitate somewhat similar solutions. And it seems logical, after all, that the very scarce and precious street capacity in the central city should be strictly rationed. Its use for driving and/or parking should either be prohibited or made so expensive as to restrict it to only those who would be willing to utilise the facilities at the prescribed costs. Incidentally, such an approach, by reducing the attractiveness of private transport, would also tend to encourage greater use of mass transit facilities.

Perhaps the most urgent matter in the context of rationing street space in congested areas concerns the desirability of removing outmoded methods of movement like tramways and animal-drawn vehicles from congested or arterial routes so as to improve the utilization of high-speed automotive vehicles.

In some cases, considerable traffic meant for farther destinations or points at the other end of an urban area may have to be passing through the central city, experiencing the difficulties of congestion, and adding further to them. In such cases the situation can be improved by providing bypass roads or circumferential highways for through traffic.

Congestion is caused not only by passenger traffic but also by goods traffic. Huge amounts of freight are brought into the city and taken out of it. Large-sized trucks and other goods vehicles receiving or delivering freight on the kerb-side cause a great deal of hindrance to normal traffic. Bottlenecks or congestion arising from this source may be reduced by restricting these transactions to off-peak hours or, if necessary, to night hours.

Organisation of the Transit Industry

As we have seen, bus transit has the potential of providing the most effective answer to the problem of moving large numbers of people in the crowded urban conditions, at minimum cost. In Pakistan, unfortunately, this important industry is woefully under-developed. The stage carrier fleets are grossly inadequate compared with the growing needs of urban areas, and are in poor shape due to lack of maintenance and other facilities.

The motor transport industry in the private sector is ill-organized, being composed generally of small operators owning one or two vehicles each, and unable to provide dependable service. Their break-neck competition

with one another results in evils like speeding, overtaking, overcrowding and nonobservance of time schedules. The need is to organise private operators into larger and more viable units or syndicates; to arrange provision of institutional credit facilities to help their development; and to regulate these services effectively as public utilities. In larger cities, mass transportation can probably best be provided through a single public corporation. This is strongly indicated by the highly deplorable condition of bus transit in the city of Karachi, where the private operators have apparently failed to meet the requirements of the city. For some reason or the other, hardly 500 buses are currently on the road, against about 1500 or more permits issued to private operators, and it seems that the vacuum cannot be filled except by a well-organised public corporation.

Things are better in areas where government sponsored agencies are operating. As a general rule, however, the transit industry is faced with the difficult problems of rising costs and shortage of equipment and spare parts. Under these circumstances, it is impossible to maintain a reasonable standard of service. If the objective is to popularise mass transportation among a wider cross-section of people, then the service will have to be improved to more acceptable standards. This will require pressing more and better buses into service, minimising overcrowding, improving time schedules, providing express services, and so on. To this end, the supply of vehicles and spare parts will have to be increased and adequate financing and administrative arrangements made.

The level of fares, which is generally on the low side at present (that is, if one does not compare it with the miserable quality of service) may have to be suitably raised. A pertinent issue here is that until sufficient transit capacity is developed, the available capacity must be rationed. One way of doing this would be the introduction of suitable zone fares so as to discourage short-distance riders and reduce avoidable congestion in buses.

The Peak-Hour Problem

An extremely critical problem which creates serious organizational and financial difficulties for the transit industry concerns the heavy rush of transit riders commuting between residence and work during a couple of hours in the morning and a similar period at the end of the working day. This pattern of urban traffic means that capacity for the peak period has to be maintained, a large part of which must remain idle during the off-peak hours. Likewise, manpower is to be hired with reference to peak period requirements, but must be paid for the whole day. This increases the costs to the industry and reduces the service standards for the rider. The problem is a complex one, and difficult to solve. It may however be mitigated to some extent if it could be possible to stagger the hours of work with a view to

smoothing out the peaks. There are, of course, the constraints that different businesses of a mutually complementary character want to work during the same hours of the day, and nobody likes the idea to going to work very early in the morning or returning home very late. But if these difficulties could be surmounted, the problem of commutation between residence and work would have been eased considerably.

On the supply side, the transit operators could consider the use of trailer-buses during peak hours where route conditions would permit their operation. Trailers can provide peak hour capacity at cheaper capital and operating costs.

It must be stressed, however, that important as these measures are, they are mainly short-term expedients. For a lasting solution of the urban transport problem, as indicated in earlier paragraphs, the fundamental requirement would be the creation of a unified urban transport authority in each urban area, which would be responsible for ensuring proper organization, regulation and coordinated development of the various modes of transport so as to provide an optimum transport system. Also, this authority should work in close collaboration with the city planning authority, mentioned in the initial part of this paper, with a view to ensuring the evolution of a multi-regional city, based on the potentialities of modern transport technology, and which would be capable of being provided with adequate mobility.

Railway and Transportation for Urban Areas

MUSHTAQ AHMAD

INTRODUCTION

Transport is one of the greatest problems of man. Even the conquest of space and a trip to the Moon, the Mars or other Planets is basically a problem of transport.

An efficient system of transport is the backbone of a sound economy. The absence of transport facilities is known to have resulted in misery to people and starvation, in the same country or province, within a few miles of an area of plenty and surplus. Even in today's modern and advanced world, things would be substantially different, and life richer and more meaningful, if transport could be made quicker and cheaper.

Although when we speak of the problems of transport, we have in mind the problem of carrying men and materials over long distances, transport over shorter distances, as for instance into and within the limits of a metropolis and its suburbs, has its own peculiar problems which are probably more difficult to resolve, and call for careful study, planning and management.

In the late Middle Ages, places in Europe having 10 to15 thousand inhabitants were known as cities. In the year 1300, London had a population of only 35,000. The size of cities had to be limited by requirements of food and other necessaries of life which could neither be produced in the city nor transported from far, due to insufficient production and lack of fast and adequate means of transportation. Technology in agriculture, industry and transportation made it possible for cities to grow in size. Greater productivity on the farms and faster transportation provided by the steam locomotive and the internal combustion engine have sprinkled the world with cities and raised the old ones to the level of metropolitan areas. The phenomenal growth of urbanization in the world is a recent one, dating back to the Industrial Revolution.

The size of large urban areas also depended on improved means of local transportation in substitution for walking. The automobile, the bus, the electric tram, the railway train, and even as modest a contrivance as the bicycle have helped expand cities in area.

While better transportation has speeded up the process of urbanization, it is one of the anomalies of the modern age that the tempo of urbanization has gained such momentum as to leave transportation capacity behind, with the result, that, despite so much progress in its quality as well as quantity, large cities and industrial centres are finding it difficult to cope with the requirements of transportation, whether in respect of men or of goods and other services necessary for the conduct of daily life.

PROBLEMS

Now we may proceed to the more prominent of these difficulties.

1. The size of modern metropolitan and other large cities and industrial centres magnifies the feature of double handling involved in the transport of goods from factory, store or godown to the railway station or *vice versa* in addition to their transport by rail. Road hauliers who provide a door-to-door service eliminate this double-handling, thus making their mode of transport attractive from this angle. Double-handling involves not merely extra cost, but also inconvenience, delay and possible damage to goods. The cost factor can be appreciated from the fact that whereas a consignee in Karachi pays to the Railway Department an average of about Rs. 150 to Rs. 200 for a wagon of charcoal, firewood or bhoosa from the up-country to Karachi City—and these commodities constitute the bulk of the inward traffic there — he has to incur an additional expenditure of Rs. 50 to 60 on its transport by road to the consuming centres. Facilities for the direct booking of goods to the distant points would help bring down the prices of essential commodities and improve the standard of living of the common man.

2. In a growing metropolis, the existing railway terminal or terminals become congested and inadequate for both inward and outward traffic, particularly the former. Unfortunately, the present sites, in most cases, have no room for further expansion. It becomes necessary to diversify the terminals, and set up subsidiary goods shed in other parts of the city in order to facilitate the handling of goods.

In the case of Karachi, for instance, the inward goods shed was finding it difficult, at times impossible, to cope with the traffic because the shed has a theoretical capacity of 300 wagons but a working capacity of 150 wagons only, due to delays on the part of consignees in unloading wagons or in removing their goods from the shed. The result was the restrictions had often to be imposed on the booking of goods to this station, thus hampering the trade of the city and causing prices to go up, resulting in loss to businessmen and hardship to the common man.

3. The construction of additional terminals in metropolitan areas poses stupendous problems in view of their expansion in directions dispropor-

tionately away from the railway, and the lack of provision in town development schemes for possible construction of railway lines, sidings and sheds at a future date. Karachi, for instance, had been expanding towards the North and the North-East, thus making the present Karachi City Station very much out of the way for the newly developed areas, and this made it imperative to locate the main station more centrally in the Greater Karachi area.

4. The rapid increase in population and the development of suburbs, satellite townships, industrial areas, etc., gives rise to the problem of transport within the city. The common man experiences great difficulty, especially during the morning and afternoon hours of the peak of the traffic to and from offices and factories, and has to wait for buses, which are overcrowded, irregular, and unreliable. This state of affairs, in the long run, impairs the efficiency of offices, and affects the output of factories. The need for a good, efficient and reliable mode of transport is paramount.

5. Transport within the city, for instance, of a huge metropolis like Karachi, would require such a large number of additional buses as to cause tremendous traffic jams during the peak hours of the morning, the afternoon and the evening, thus having the undesirable effect of slowing down traffic, and causing people to arrive late at their offices or factories, or back home from work or recreation. There is a limit to the extent to which streets can be widened to handle more vehicles.

6. For a suburban railway line, the acquisition of land in areas, which are often heavily over-built, becomes a difficult as well as very costly affair. The alignment presents problems, the solution of which is expensive, and at times, stupendous. For instance, the construction of the Karachi Circular Railway involved the shifting of underground gas and water pipelines, underground and overhead electric cables and telephone and telegraph lines, sewers and roads, and the demolition of buildings. At others, the alignment had to be modified to suit the existing location of road overbridges, station sites, and crossings of rivers, nullahs and utility services. This resulted in adding to the length of the line. Both the alignment proposed as a result of the surveys carried out in 1924 and 1948 would have been more suitable, only if land had been acquired at that time.

7. The alignment of such a line, and the location of stations on it, have to be decided in consultation with all the concerned interests, and there may, at times, be serious differences of opinion.

8. The construction of a suburban railway also involves the problems of noise, dust and trespass in densely populated localities, and of demarcating the railway boundary in thickly built-up areas.

9. Suburban trains have to accelerate and decelerate quickly, have short stoppages at stations, and move without wasting time in waiting for other trains in the same or the opposite direction.

10. The shortage of houses in large cities and industrial areas obliges office and factory workers and labourers to reside in small road-side towns, and this gives rise to the problems of commutation of thousands of persons and their school and college-going children at specified hours in the morning and afternoon. In some cases, the distance involved could be about a hundred miles either way.

PAKISTAN WESTERN RAILWAY'S ROLE VIS-A-VIS THESE PROBLEMS

After having enumerated the more important problems which have a bearing on the requirements of transport in urban areas, I now wish to explain briefly what the Pakistan Western Railway has done or can do in respect of each of these.

1. *The Problem of Transport of Goods to and from the Railway Station*

   a. City Booking Agencies have been opened by the Railway in the trading and marketing centres of large cities of both outward and inward goods, for the convenience of the business community. The extra charge for transport of goods between the Agency and the railway station is nominal, depending upon local conditions.

   There are 19 City Booking Agencies in 14 cities of West Pakistan (*viz*, Gujranwala, Hyderabad, Khanewal, Karachi, Lahore, Lyallpur, Mardan, Montgomery, Peshawar, Rawalpindi, Sargodha, Shikarpur, Sialkot and Sukkur) and these Agencies handle a considerable amount of outward and inward goods annually. The volume of traffic handled is evidence of the appreciation which people have for the service provided by these Agencies.

   b. A scheme, which has been finalized for implementation in the Third Five-Year Plan, provides for the introduction of Rail-Road Collection and Delivery Services at Lahore and Karachi, the two largest cities of West Pakistan which are commercially of the greatest importance to the Railway, and where road competition is most acute and door-to-door collection-delivery service is very much needed and most likely to be patronised. Linked with this is the necessity of introducing radial collection and delivery of goods from smaller road-side stations situated close to these large cities.

The main purpose of the project is to enable the Railway to provide additional facilities to the trading community in order to overcome the inherent disadvantage of not being able to provide a door-to-door service which has been mainly responsible for diversion of even long-distance traffic from rail to road—a traffic which falls within the railway's legitimate sphere of activity. Further, radial collection and delivery of goods at smaller road-side stations, situated close to Lahore and Karachi, will help quicker clearance of inward and outward goods from the large depots at Karachi and Lahore stations. This will not only prove more economical in the long run, but will also avoid a number of transhipment and handling operations, and help reduce the time-lag in the clearance of such goods from and to those stations.

The benefit accruing from this project to the trading community will be that they will have the additional facility of goods in "smalls" being carried from the business premises of the consignor to those of the consignees—a service not provided by truckers in this country. By providing this additional facility to the trading community, the railway expects to retain its legitimate share of long-distance traffic, which is being diverted from rail to road, on account of the railway's inherent inability to provide door-to-door service. Collection and distribution of goods in " smalls" by road to and from road-side stations situated close to Lahore and Karachi would also be quicker, as well as more economical, by this method than it is by rail.

c. The Karachi Circular Railway has taken the railway line and goods sheds nearer the residential and industrial areas of Greater Karachi, and is expected to pay an important part in the growth and development of these areas. The linking of Wazir Mansion and Karachi City stations during the Third Five-Year Plan will further improve the service rendered by the Karachi Circular Railway.

The Landhi-Korangi spur serves the same purpose, although a direct connection from Korangi to Karachi Cantonment station would save the passengers the detour *via* Landhi.

It is also contemplated to examine the proposal to have an "outer loop" to the Karachi Circular Railway, taking off from Nazimabad and terminating at Malir Cant., in order to serve the numerous townships in the north as envisaged in the Greater Karachi master plan, *e.g.*, K.D.A. Scheme No. 2, K.D.A. Scheme No. 16, North Karachi Township and Karachi University Campus.

d. A rail link will be provided in due course to connect the main line with Islamabad. This will assume the form of a loop, about 14 miles long, taking off from the main line between Chaklala and Lohi Bhir and rejoining it at Bokra (a new station proposed to be opened about three miles north of Rawalpindi) after passing through Islamabad. For the present, only a 5½ mile-spur will be laid from Bokra to Islamabad. This spur will be extremely useful in the immediate future for transport of large quantities of building materials to the site of the Capital during construction.

2. *The Problem of Congestion in the Inward Goods Shed Caused by Increase in Population*

The construction of the Karachi Circular Railway has brought considerable relief to this shed. The Railway has provided a further incentive to the people to book their inward consignments of charcoal, firewood and bhoosa to Wazir Mansion instead of to Karachi City, by quoting the same freight rates for both the destinations, in spite of the longer distance in the case of Wazir Mansion.

3. *The Problem of Lack of Provision in Town Development Schemes for Future Expansion of the Railway*

This probably can be solved only by Town Development authorities consulting the Railway before finalizing their schemes, as, for instance, was done in the case of Islamabad.

Lahore is another city in West Pakistan which will probably need a suburban railway in the not-too-distant future ; whereas, a considerable number of town development schemes have been finalized and implemented without consulting the Railway as to their possible requirements. This is going to create problems in the future, and demonstrates the need of coordination between the Town authorities and the Railway.

4. *The Problem of Passenger Transport within a City*

Suburban trains and rail cars running on the Landhi-Karachi City, Landhi-Korangi and Lahore-Jallo sections solved this problem to some extent.

The Karachi Circular Railway, though it does not enter the heart of the city, augmented the city's transport capacity considerably. A similar project for Lahore would probably be justified in view of the expansion of the city towards Samnabad, Gulberg, New University Campus, Model Town and Kot Lakhpat.

The number of suburban trains at present running on the above sections is as follows :-

Landhi-Karachi City	.. ...	28
Landhi-Korangi	.. ..	4
Malir Cantonment-Karachi City	..	24
Karachi Circular Railway	..	16
Lahore-Jallo	.. ..	36
Total	..	108

The Railway issues monthly season tickets to all classes of passengers at concessional rates. In the case of third class passengers, 18 single mail fares are charged. The cost of the monthly season ticket is one half for students.

On the Lahore and Karachi suburban sections, cheap tickets have been introduced at rates 25% and 50% respectively lower than the normal fares. On the Karachi suburban section, the rates of the monthly season tickets too are fixed at about 35 to 45% less than the normal rates for such tickets.

The single-journey and monthly season ticket charges from Landhi to certain stations in the Karachi area, showing their comparison with normal fares, in rupees and paisas are given below :-

To	Distance (miles)	Normal fare	Cheap fare	Normal M.S.T. fare	Cheap M.S.T. fare
Karachi City ..	15	0.50	0.20	11.15	6.30
Drigh Road ..	7	0.30	0.15	5.00	3.15
Wazir Mansion ..	24	0.80	0.40	17.00	11.05
Korangi ..	4	0.15	0.15*	3.80	2.40

*0.15 is the minimum fare.

The rates charged on the Karachi suburban section are cheaper than those by bus, and the Railway is actually running at a loss in providing this service. That is the contribution the Railway is making toward solving the tremendous human problem of hundreds of thousands of low-paid labourers and workers obliged to seek a quick but cheap mode of transport between their places of residence and remote places of work.

5. *The Problem of Traffic Jams on the Roads during the Peak Hours of the Morning and the Afternoon*

As stated already, this problem would arise if sufficient number of buses for the entire traffic were put on the road in a city like Karachi. The Karachi Circular Railway, by running suburban trains equal in capacity to about 800 bus-loads, has helped reduce congestion on the roads to a considerable extent.

Moreover, rail transport in urban areas has some advantages over road transport, as for instance :

a. The number of passengers carried by a single-track railway during rush hours is much more than that by a four-lane express-way in one direction.

b. For a given number of passengers, the cost of operation of diesel railcars or diesel-hauled trains is about 50% less than that of buses.

c. Trains do not have to wait at traffic lights on street intersections, or steer through road vehicles and pedestrians.

6. *The Problem of Exorbitant Cost of Land and of Alignment through Heavily Built-up Areas*

In the case of Karachi Circular Railway, the Pakistan Westren Railway had to pay about Rs. 1½ crores as cost of the land, and about Rs. ½ crore as compensation to the various companies and departments for shifting of their lines, structures, etc. This expenditure of approximately Rs. 2 crores could have been reduced to about one-tenth by advance provision of the Railway requirements in the Karachi development schemes and timely acquisition of land.

The same reason resulted in the length of the Karachi City Railway being increased by about a mile due to re-alignment of the track at Dalmia Cement Factory, Nazimabad and other places.

The Karachi Circular Railway has made no attempt to enter the more congested parts of Karachi *e.g.*, McLeod Road, Bunder Road, Elphinstone Street, etc. because it would not have been possible to find a path for it through all the buildings and structures. If ever the main city is to be served by a railway, it will have to be either under or above the ground level.

7. *The Problem of Making the Alignment Suit Different Interests in the City*

The alignment of the Karachi Circular Railway was decided after consulting all the interested parties *viz.*, the Chief Commissioner,

the Karachi Municipal Corporation, the Karachi Development Authority, the Sind Industrial Trading Estate, the Chambers of Commerce, the Industrial and Trade Organizations and the Welfare Officers of the numerous refugee colonies. The Officer put in charge of the task also consulted as many persons as he could in buses and on street payements.

8. *The Problems of Noise, Dust and Trespass in Thickly-Populated Areas*

The problem of noise is proposed to be got over by welding the rail joints. In thickly built-up areas, the railway boundary will be demarcated by the erection of boundary walls, which, incidentally, will also reduce the elements of noise and dust. At other places, fencing will be required to prevent trespass. The Pakistan Western Railway, however, does not plan incurring this additional expenditure in the near future.

9. *The Problem of Speed for Quick Transport of Passengers*

Speed is a matter of vital importance in the operation of suburban trains, if they are to constitute a really useful and popular service. The Centralized Traffic Control installed on the Karachi City-Landhi section has reduced the running time of suburban trains from about one hour to 45 minutes. It is proposed to extend this system to the Karachi Circular Railway on future date, depending upon development of traffic and availability of funds.

Other steps which have been taken to improve speed include high-level platforms enabling passengers to entrain and detrain quickly, and short stoppages at stations enroute.

At present the suburban trains are hauled by diesel-electric locomotives, but the ultimate goal in this regard is multiple-unit, diesel or electric railcars, or electric coaches. These will reduce travel time on the suburban trains by providing quicker acceleration and deceleration, and saving the time spent in having to shunt the locomotive from one end of the train to the other at Landhi in the case of train moving between Korangi and Karachi City.

10. *The Problem of Transporting Workers Between Large Cities and Industrial Centres Where They Work and Nearby Towns Where They Reside*

On sections which do not have suburban trains, the Railway tries to provide passenger services so as to connect large cities and indus-

trial centres with adjoining stations. Such trains are timed to reach the city between 6 and 7 hours in the morning, and start the return trip in the afternoon. Normally, there is just one such service in the morning, but, in the afternoon and evening, the commuters generally have more than one train to choose from.

As already mentioned, monthly season tickets are issued to ordinary passengers at concessional rates, and to students at half the concessional rates, in order to provide a cheap service to low-income people who are unable to afford costly accommodation in large cities, and are obliged to take up residence in nearby towns.

Urban Transportation in Foreign Countries

Having discussed the major problems of transport in the urban areas of Pakistan, it should be of interest to see what railways in the developed countries of the world have done in this respect.

For passenger traffic, the undergound or tube railway, or the metro, as it is called in France, is a concept of transportation which is fairly old. Such railways in New York, Paris, Moscow and London, are well-known systems of this kind. The size of these railways and the volume of traffic handled by them is as shown below:

	Mileage	No. of Stations	Passengers Daily (Lakhs)	Passengers Daily Per Mile (Thousands)
New York ..	238	482	37	16
Paris	106	344	32	30
Moscow ..	47	50	25	53
London ..	226	230	19	8

As compared with these, the underground railways in Japan, though of small mileage, have high traffic density—that on the Osaka underground railway of 9 miles being the highest anywhere in the world. Similar

information, as given above, in respect of Osaka and Tokyo is as follows:

	Mileage	No. of Stations	Passengers Daily (Lakhs)	Passengers Daily Per Mile (Thousands)
Osaka ..	9	13	6	67
Tokyo ..	15	24	5	23

The elevated railway system is a rather more recent concept and has been adopted in Germany, U.S.A. and Japan. The Haneda Monorail of Tokyo which links the Tokyo International Airport with the city centre—a distance of 8½ miles—does the run in 15 minutes and carries 30 thousand passengers daily on weekdays, and 50 thousand on Sundays and holidays. The buses take at least an hour to cover the distance between the two points.

The main advantages of these transit systems, from the point of view of the subject under discussion, are that the capital cost of property is saved, and railway level-crossings, which are one of the big obstacles to the smooth flow of road traffic, are eliminated. The Karachi Circular Railway, for example, has two dozen such level-crossings.

In the case of the elevated transit system, however, noise is a major problem, despite the employment of architectural and mechanical devices to reduce it. Residents and commercial houses in Seattle, U.S., for instance, have preferred claims for depreciation of the value of their property as a result of unbearable noise.

France is experimenting with something still better than the monorail, *viz.*, the aerotrain, which is based on the air-cushion principle, and it is expected to be placed in service in 1966. The aerotrain will provide a rapid service from city centre to city centre, or from city centre to airport, at a speed of about 250 miles per hour, thus competing in speed with the airways.

The time for introducing the underground or elevated transit system in Pakistan has not yet arrived. The local passenger traffic of Karachi or Lahore has to grow to at least five times the existing volume in order to justify the tremendous cost involved in the construction of these systems. As the population of these cities will only be about thrice of what it is at present by the year 2000, the construction of an underground or elevated transit system will have to wait the dawn of the next century.

For transport of goods in large cities, a door-to-door service is provided by many foreign railways by means of wireless fitted camions, which go to houses and business premises for collecting smalls at stations of origin and delivering these at destination stations after transportation by rail, or by means of sealed trailers of about 10-ton capacity which are hauled by motor vehicle to and from railway stations and driven on to flat wagons for transport by train. A flat wagon takes on two such trailers or containers. Commonly known as the piggyback service, it is, in effect, a combination of rail and highway modes of transportation. Its popularity can be judged from the fact that, during 1965, the railways in the U.S.A. handled about six million trailer-containers.

Environmental Safety and Road Transportation

M. SULAIMAN

Urban civilization is complex and constantly changing. Changes will occur in environment, the exact nature of which is only beginning to emerge.

The first urgent problem today is to attempt to have a reasonably clear idea of the kind of environment we wish to have, taking into account the mobility caused by the mechanically propelled vehicles in urban areas. This paper is an attempt to integrate the idea of the town with the mobility caused by 'motor car'.

The problem of traffic in towns has now become front page news. In spite of all the publicity, it does not appear that the nature or the magnitude of the task facing those concerned with it is fully understood. Certainly, the means of dealing with the problems are not evident in any town and city of our country. We are now living in the 'motor age' but our thinking is still loaded in terms of a camel cart.

Traffic cannot be considered as an isolated engineering problem. Solutions can only be produced in terms of town planning as part of policy of urban renewal or expansion, which is a comprehensive and a continuous activity. The world famous Professor Colin Buchnan of the Imperial College, London, observed:

> "............the traffic problem is design problem, to devise arrangement of buildings, the spaces around them, access ways and circulation routes in a manner that will permit the fullest use of the motor vehicles while at the same time retaining or creating good urban environments.

In considering these matters we must first ask ourselves a question; what kind of town do we want? We can let traffic increase based on the rising car ownership and car usage dictate the form of new developments and here Western experience must act as warning as to the mode of living we desire. This can ultimately result in a form of life based on the use of motor car, with sprawling areas of development eating up the open spaces in and around our towns. Apart from the question can we afford this now or in the future, there is the implicit danger of the destruction of our towns as we

know them. On the other hand we can assume that town life is desirable and should be improved to provide the best possible environment. Then in this case town planning is a vital process, which should guide the development of roads as much as that of houses, industry and open spaces. In other words, motor car can be used to assist low density living, or to link together high density compact developments with the resulting safer and shorter and shortest distances for pedestrians within the urban areas. Thus, traffic, motor and pedestrian, must be considered as one of the planning elements in a town and not isolated subjects which can be allowed to determine the shape and quality of the town.

After these general observations, I will now attempt to show the importance of traffic engineering which plays a vital role in environmental safety and road transportation in urban areas.

The Institution of Civil Engineers of Britain defines Traffic Engineering as:

> That part of Engineering which deals with traffic planning and design of roads, of frontage developments and of parking facilities and with the control of traffic to provide safe, convenient movement of vehicles and pedestrians.

The function of the traffic engineers is to obtain the greatest potential capacity as economically as possible with a reasonable safety out of the roads network. He makes full use of traffic management, operation regulation and control and by his skill is able to plan road and traffic network to meet to present and anticipated demands. To do so he is dependent upon others, particularly the planners. Movement of persons and goods arises from the use to which land is put. In our own urban areas there is not the desired amount of planning for land use.

To obtain from urbanization and motorization the maximum benefit economically and socially both urban planning and traffic planning are essential and these must be undertaken at the same time. Although the traffic engineer has emerged as the traffic specialist, his whole contact cannot be limited to traffic management and operation. It must extend to planning as to ensure the potential capacity of the road network now and in future. Because of the inter-relationship of all forms of transport, the traffic engineer cannot restrict himself to roads but must have regarded to all means of transport, both public and private and its coordination.

The raw materials that the Traffic Engineer uses are the vehicle, the road, and the individual.

The immediate tangible results obtained from traffic engineering can be seen in short term measure which aims to minimise accidents where traffic streams conflict or concentrate, and thereby improve traffic flow.

In the U.S. there are over one thousand traffic engineers, employed by different Urban and State authorities. In Chicago alone there are more than 120 traffic engineers. The average salary of traffic engineers is over $20,000 per year.

In civic administration the traffic engineer enjoys a 'Cabinet Status', and no planning is permissible without his consent.

The annual budget of the Traffic Departments of Detroit amounts to 1.5 million dollars.

There are, under-graduate, graduate and post-graduate courses in traffic engineering in most of the important universities in Europe and in the U.S. In addition there are Traffic Engineering Research Laboratories in the U.S. and in practically all countries of Europe. Furthermore, interested commercial organizations give liberal grants to traffic research.

In addition there are hosts of other organizations which educate the public in traffic engineering and road use.

What is the position in Pakistan? In so far as I am able to ascertain, there is not a single teaching or training institute in our country for traffic engineering.

Traffic Position in Karachi

Karachi is the most important city of Pakistan. It is estimated to have a population of over 25 lakhs. It is pivot in the economic set-up of our country. It has more motor cars than the rest of West Pakistan. The growth of mechanically propelled vehicles is quite steady and is doubling every six years. By the end of 1972, it can be assumed that Karachi would have more than two lakhs of such vehicles.

Mechanically Propelled Vehicles

According to a public statement by Mr. Ahmed Sadik, Deputy Commissioner, Karachi, it is expected that there would be another addition of 3,600 motor vehciles by the end of the year. This staggering figure of over one lakh of vehicles on the streets of Karachi produces a host of problems.

Many of these vehicles are not road-worthy. There are only two Motor Vehicle Inspectors. They can check few vehicles in a year.

It is suggested that buses and trucks should be compulsorily checked for road worthiness by qualified staff every three months. Other mechanically-propelled vehicles may be tested at longer intervals. This should be in addition to surprise checking. The quality and number of such inspectors should be increased.

There is a steady rise in the number of accidents with the increase in the number of vehicles. In 1955 when there were 26,552 mechanically-propelled registered vehicles in Karachi, there were 120 fatal accidents and 1,164 persons were injured in road accidents. These figures do not include minor injuries or damages. There are certain categories of accidents which are not at all recorded by the police. There are also a number of accidents which are never reported.

Which types of vehicles are more involved in accidents on roads in Karachi? Table No. 1 gives details about these vehicles for the year 1961 for which data is available. (But the figures are basically not very different in trend from other years). A study of these figures indicates that a total of 197 persons were killed in accidents on roads in Karachi in 1961.

Table No. 2 gives a simplified study of fatal accidents in Karachi in 1961 and in which different types of vehicles were involved. The overwhelming majority of those killed were pedestrians and this trend continues.

Road and Vehicles

Britain is reported to have the highest density of vehicles per mile of road. She has 37% more 'vehicles' per mile of road than the U.S. Table No. 3 gives a mile of road per square mile of territory in few countries. It also gives miles of roads per lakh of population. The total miles of roads in West Pakistan is 28,000 miles out of which 9,250 miles are graded as "high types of roads". By population it comes to 65 and 21 per lakh of people. Details of road accidents in Britain in 1958, are as follows:

1.	Mechanically propelled vehicles registered in Britain were	77,50,000
2.	Total number of accidents	2,37,265
3.	Vehicles involved in accidents	3,75,125
4.	Numbers of persons killed in accident	5,970
5.	Seriously injured	69,166
6.	Total casualties	2,99,767

If we compare only the deaths caused by road accidents in Britain and Karachi then the picture is as follows:

1. In Britain on an average 1,300 vehicles were involved in causing death of one person in road accidents in 1958.

2. On an average 267 vehicles were involved in causing death of one person in road accidents in Karachi in 1957.

In other words in Britain the death caused by the road accidents by mechanically propelled vehicles was five times less than in Karachi.

Figures of Karachi for 1965 indicate a better trend but is still three times worse than that of 1958 Britain.

So when some people maintain that there are less accidents in Karachi compared to other western countries they are not really giving true picture. This is practically bad when on an approximate average there only 7 mechanically propelled 'vehicles' in West Pakistan per mile of road. In Karachi it may probably be 62 vehicles per mile of road (basing these figures on 25 lakh population of Karachi *i.e.* 65 miles per lakh of people = 1,625 miles of roads).

If we take 15 feet as an average length of vehicle and stretch all of these at the same time, bumper to bumper, then this approximates to one-sixth of the whole road system of Karachi.

ROAD DESIGN AND ADMINISTRATION

The roads of Karachi are poorly designed. Apart from structural defects there appears to be lack of ordinary geometrical design standards.

Regarding road administration it is well known that there are far too many road authorities in the city. There is a need for coordination, and I am happy that Karachi Development Authority has proposed the establishment of such a body recently.

ROAD WORKS, REPAIRS AND DIGGING

Road work will nearly always involve some disturbance of traffic flow; but much can be done to reduce it by the engineers foresight in design and by the employment of contract procedure dictated by common sense, by the urgency of the problems, and by an enlightened public opinion.

POLICE AND CONTROL

The Traffic Police of Karachi consists of (figures given by the Police Office):

1. Superintendent of Police (Traffic)	1
2. Deputy Superintendent of Police (Traffic)	1
3. Inspectors	3
4. Sub-Inspectors	32
5. A. S. Inspectors	13
6. Head Constables	52
7. Constables	430
	532

The Police control points from 7.00 a.m. to 10.00 p.m. except at the Airport where the duty is for 24 hours and at cinemas where the policemen remain till midnight.

This Police force is inadequate. The number of officers and constables must be increased. Officers must be provided with adequate training and sufficient transport. This force may be augmented by honorary Police Officers selected from respectable citizens with a distinguished mark on their vehicles.

ROAD TRANSPORT

The "Report on West Pakistan Road Traffic Survey, 1961-62", published by the Government of Pakistan, Ministry of Communication, Rawalpindi, gives some important facts regarding public transport in Karachi. Some of these figures are given below:

Density of Passengers Traffic in Karachi City, in 1961

1.	Passenger miles, Buses	...	...	1,01,43,889
2.	Vehicles miles, Buses	...	...	2,12,014
3.	Passengers miles, Trams	...	...	8,44,068

Average load per trip for busses has been worked out to be 44 passengers and it is assumed that a bus travels 100 miles per day.

On the basis of above loading and of 100 miles per bus per day it would have required in 1961 a total of 2,305 buses. At that time it was found that there was a shortage of 1,278 buses.

What is the position now? At the end of 1966 there are 2,940 registered buses. Quite an impressive figure, but how many are actually plying on the streets of Karachi? Different figures have been published in newspapers but it can safely be said that the actual number is less than half of those registered. What about bus-owners? There are far too many, majority being one bus owners. Their object being limited to profit. They ply buses in dangerous conditions. Smoke coming out of buses is an example, with which every one is so familiar.

There is an urgent need for a coordinated transport policy for the city of Karachi. The city transport, it is suggested, should be municipalised and put as a social service. There appears to be no other remedy. More buses on the streets are needed. If public transport is good and efficient we would be able to reduce private vehicles which we can hardly afford. It is no use saying that U.S.A. has got so many vehicles and compared to that we have

almost nothing. But we must not forget that U.S.A. apart from being rich, directly or indirectly employes one out of three working persons in the automobile industry. This industry plays a vital role in the economic set up of that country. The same cannot be said of Pakistan. Till we develop automobile industry, would it not be more prudent that we depend more on public transport?

Goods Transport

Overloading and dangerous loading is a common feature. This should be looked into and goods traffic prevented or discouraged during peak passenger traffic.

Licensing

Driving licence should be given with as much care as is employed for giving fire arm licences. After all a mechanically propelled vehicle is more lethal than an ordinary shotgun. A motor vehicle is a mass of metal weighing a ton or more, can be hurled from a stand still to 50 or 60 miles an hour or more in a matter of second by the lightest touch of a couple of levers. Most accidents are attributed to drivers' own faults. Therefore, particular care should be taken in giving driving licences and particularly to drivers of public vehicles. Drivers should be frequently checked for good health, good road sense and good skill. Intoxicant drivers should be eliminated for alcohol even in small quantity has some adverse effects on a motor car driver. One of them is that his 'reaction time' the time between his becoming aware of an obstacle and his taking action to stop or avoid, is increased.

In conclusion, it is suggested that traffic engineering should be applied to our traffic and transport problems. Educating the public in properly sharing the road should be undertaken at all levels. Traffic rules and regulations and enforcement should be looked into and brought upto date to meet present day requirements. A traffic engineering department should be created in the city and the traffic engineers should be associated at all stages of planning and development.

Present day traffic conditions should be surveyed and solutions found also within the existing net works of our roads. The Government, civic bodies and the motor vehicle importers should be requested to contribute to the establishment of a traffic research laboratory. If we can solve the traffic problems of Karachi, we would be solving more than 50% of West Pakistan's traffic problems.

Development authorities like K.D.A. should be requested not to create more 'Blind Corners' in their new schemes.

A master road-plan should also be drawn up for greater Karachi.

The possibility of building urban motor ways be looked into, although we may not be able to afford it now but if land is left for its construction at suitable places then we could be doing a great service to the next generation.

Development authorities should not be allowed to operate on a no profit and no loss basis.

TABLE I

Traffic Accidents during the Year 1961 in the Karachi Administratrotive Area and the Number of Persons killed and injured by different types of Vehicles

S. No.	Types of Vehicles	Killed	Injured
1.	Car and car...	—	94
2.	Car and Bus	2	48
3.	Car and Truck	—	30
4.	Car and Victoria	1	5
5.	Car and Camel Cart	—	2
6.	Car and Donkey Cart	—	36
7.	Car and M. C. Rickshaws	3	131
8.	Car and Motor Cycles	—	46
9.	Car and Pedestrian	31	107
10.	Car with Wall and Pole	—	34
11.	Car and Tram	—	4
12.	Bus and Bus	—	60
13.	Bus and Truck	1	33
14.	Bus and Victoria	—	5
15.	Bus and Camel Cart	1	2
16.	Bus and Donkey Cart	—	10
17.	Bus and Hand Cart	—	3
18.	Bus and M. C. Richskaw	7	50
19.	Bus and Motor Cycles	—	2
20.	Bus and Cyclist	7	27
21.	Bus and Pedestrian	53	47
22.	Bus with Wall and Pole	—	8

S. No.	Types of Vehicles	Killed	Injured
23.	Bus and Tram	1	4
24.	Truck and Truck	—	15
25.	Truck and Victoria	1	2
26.	Truck and Camel Cart	—	2
27.	Truck and Donkey Cart	—	7
28.	Trucks and M.C. Rickshaw	6	57
29.	Truck and Motor Cycles	—	12
30.	Truck and Cyclist	4	13
31.	Truck and Pedestrian	50	78
32.	Truck with Wall and Poles	—	10
33.	Truck and Tram	—	9
34.	M. C. R. and M. C. R.	1	30
35.	M. C. R. and Victoria	1	22
36.	M. C. R. and Motor Cycle	—	20
37.	M. C. R. with Wall Pole	—	10
38.	M. C. R. and Pedestrian	10	241
39.	M. C. R. and Trams	—	6
40.	Cyclist and Car	4	26
41.	Motor Cycle and Tram...	—	2
42.	Motor Cycle and Pedestrian	4	52
43.	Motor Cycle with Wall and Pole	4	2
44.	Motor Cycle and Cyclist	1	4
45.	Tractor and Tram	1	—
46.	Tractor and Pedestrian	1	—
47.	Camel Cart and Pedestrian	1	2
48.	Donkey Cart and Pedestrian	—	2
49.	Tram and Pedestrian	1	4
50.	Victoria and Pedestrians	—	3
51.	M. C. R. and Cyclist	—	13
	Grand Total: ...	197	1,532

TABLE 2

Vehicles involved in Fatal Accidents in Karachi in 1961

Types	Total Number of Persons killed	Percentage
Buses	73	37
Trucks	62	31
Cars	36	18
Motor Cycle		
Rickshaws.	10	5
Other Vehicles	16	9
Total	197	100

Note: Total number of mechanically propelled Vehicles that were Registered in Karachi in 1961 were:—

Buses	2,353
Trucks	6,639
Cars	29,698
Motor Cycle Rickshaws	5,298

ROADS IN MILES PER SQUARE MILE OF TERRITORY

Great Britain	3.2
France	3.08
U.S.A.	1.0
Spain	3.8
Ceylon	3.8
West Pakistan	0.1

BY POPULATION IN MILES PER LAKH OF PEOPLE

Australia	5,769
Canada	3,385
France	1,502
United States of America	1,834
Great Britain	384
Spain	251
Iraq	242
Ceylon	115
Malaysia	110
Philippines	87
West Pakistan	65

Resolutions Adopted by the Conference on Problems of Urbanization in Pakistan on November 4, 1966

WHEREAS, Pakistan is experiencing a rapid rate and extent of urbanization, the speed with which urbanization is taking place being much higher than either the rate of growth of the total or of the rural population;

WHEREAS, the rate of urbanization will actually accelerate over the next 20 years, to the extent that by 1985 there will be a five-fold increase in the urban population of the country as a whole;

WHEREAS, this accelerated urbanization creates a number of pressing problems for our towns, cities, and metropolitan areas, including overcrowding and a worsening of the housing situation, delinquency and crime, lack of sanitary facilities and traffic congestion, and environmental pollution;

WHEREAS, the quality of the living environment in our urban areas is critical to the health, safety, welfare and happiness of our people, and, furthermore, the quality of the urban environment is an important determinant of the economic and social progress of the country as a whole;

WHEREAS, this Conference on Problems of Urbanization in Pakistan was organized by the National Institute of Public Administration, Karachi, in order to bring together administrators, planners, architects, engineers, scientists, technicians and other specialists who are interested in and actually involved in urban affairs in Pakistan as well as other countries to provide a forum for articulating and exchanging views on these problems, and for suggesting the best practical ways and means to tackle them;

The aforementioned CONFERENCE RECOMMENDS the following:

1. Commission on Urbanization

The Conference recommends that a high-level commission be set up by the Government of Pakistan to investigate the problem of urbanization. This body will investigate in depth the nature and scope of urbanization and will make recommendations leading to constructive measures by which to cope with current and projected urbanization problems.

2. Urban Development Policy

The Conference recommends that the Government should formulate and promulgate a clearly defined growth and development policy and plan for the future pattern of urban development in the country as a whole; this policy to specify the future location, functions and size of all urban areas, and to be integrated with and based upon the government's policies and development programmes with respect to such matters as: location of industry; rural and village development; building of new towns and expansion of existing centres; housing, schools and health facilities; major transportation facilities, utilities and services and other policies and programmes affecting the pattern of urban growth in Pakistan.

3. Master Plans

The Conference recommends that in the context of the urban development policy, physical plans should be prepared for the nation, regions, cities and towns having a population of 25,000 persons or more.

4. Regional Plans

The Conference recommends that the nation as a whole be divided up into a Regional Planning Areas (taking into account such factors as: history, geography, present state of social and economic development) and that a Regional Plan should be prepared for each such Area with priority for plan preparation being given to those areas which are to be centres of projected development or have highest growth, on one hand, and greatest out-migration, on the other.

Regional planning could be the most effective way to achieve the desirable future pattern of urban-industrial development by getting tegother at the regional level the various key public policies and programmes undertaken at all levels of Government. Regional programmes for area development are a necessary bridge, translating national policies into tangible local improvements and comprehensible benefits.

5. Contents of Master Plans

The Conference recommends that the Master Plan should be a comprehensive guide to the existing and future physical development of the area to be covered by the Plan. Physical development includes land uses, structure, community facilities, transportation facilities, abilities and services—their location, function, amounts and quality. The Plan should include: (1) a set of goals, objectives, and targets effected to be achieved by the Plan for appropriately period of a generation, and for shorter, intervening time —periods of five years; (2) A detailed analysis and assessment of the existing

conditions and problems and a forecast of the future conditions and problems, contribution of existing and effected trends and policies, projected over the same time-periods as under (1); (3) Specification of principles and standards to be applied, during afore-mentioned time-periods, to achieve goals, objectives and targets, in the light of existing and future conditions and trends, changing needs and tastes, available resources, etc.; (4) Proposed legislative, organizational, financial, and other ways and means to be used to achieve goals, objectives, and targets over projected time periods; (5) Procedures for continuing review and, where necessary, revision, of the Master Plan, in the light of developments not originally anticipated.

The Master Plan should cover the whole geographic territory involved and not be restricted to administrative boundaries. It should be related to any economic and social development plans being prepared for the same area covered by the Master Plan for physical development and it should be integrated with the Regional Plan prepared for the region in which the urban centre covered by the Master Plan is located.

The Master Plan should contain and internally coordinate the problems of production, employment and workplaces, housing, transportation, social services, municipal facilities, recreation etc., in an area under study, and should treat all the problems of that area in their inter-relationship.

6. Revision of Master Plans

The Conference recommends that the continuing changes in relevant data should constantly be monitored and the Master Plan kept upto date.

7. Legislation for Master Plans

The Conference recommends that Master Plans should be backed by effective and comprehensive legislation.

8. Publicity for Master Plans

The Conference recommends that Master Plans should be publicized and people better informed about the details of these plans.

9. Urban Development Directorate

The Conference looks upon with favour the establishment of Urban Development Directorate as a step towards meeting the pressing urban problems in the East Wing. However, delegates view with some concern that the jurisdictional authority of this Directorate does not include the major cities of East Pakistan. The Conference proposes that jurisdictional authority of this Directorate be expanded to include these cities.

Furthermore the Conference suggests that the government investigate the possibilities of establishing an Urban Development Agency in West Pakistan and stresses that the jurisdiction of this agency should extend to all urban centres in West Pakistan and should be given sufficient legal and administrative authority to deal adequately with the urban problems.

10. Coordination in large cities

The Conference is of the opinion that need exists for better and more effective coordination and cooperation between multiple agencies dealing with urban administration and development, particularly in Karachi, Lahore, Dacca, and Chittagong and that this problem should be investigated by the Government.

11. Urban and Regional Planners

The Conference agrees that need exists for providing a large number of urban and regional planners to staff the central, provincial and local agencies dealing with planning and development and urges these authorities to employ such qualified personnel.

12. Education in Urban and Regional Planning

The Conference suggests that the Government should investigate the present state of education in the field of urban and regional planning and take constructive steps to develop and expand the training and educational facilities for increasing the number and quality of urban and regional planning personnel.

13. Civic Education

The Conference expresses concern about the difficulty of city dwellers, particularly recent migrants from rural areas, adjusting to life in the urban complexes of Pakistan. It was felt that consideration should be given to providing more effective civic education.

14. Desalinization of Sea Water

The Conference impressed with the progress made in the development of the atomic project for producing electricity in Karachi and recommends that a study be made for combining the production of fresh water through the desalinization process in combination with the generation of electrical power.

15. Electricity Act & Rules

The Conference recommends that the Electricity Act of 1910 and Rules of 1937 should be so revised as to provide more effective safety measures for electric installations, particularly at premises where electricity is consumed.

16. Solar Energy

The Conference is greatly encouraged that investigations were underway to harness solar power in Pakistan and the Conference urges the undertaking of further research in this field.

17. Air Pollution Caused by Motor Vehicles

The Conference is disturbed concerning the increasing air-pollution being caused by inadequate fuel combustion in motor vehicles. The Conference recommends more stringent enforcement of the existing rules regarding the fitness of vehicles in respect of their combustion capacity and precautions against emission of smoke. The Conference also recommends that the quality and number of mechanical inspectors should be increased.

18. Air Pollution Caused by Ill-planned Industries

The Conference is also disturbed regarding the increasing air-pollution in cities being caused by ill-planned location of factories and recommends that in future the normal direction of the wind be taken into account when locating factories.

19. Traffic Sense

The Conference commends the present efforts being made to improve the traffic sense of the people and thus increase safety on the roads.

20. Resolutions of Seminar on Shelterless Persons

The Conference endorses the resolutions approved by the delegates of the Seminar on the Problem of Shelterless People and Squatters in Pakistani cities organized by the Karachi Development Authority in collaboration with the National Institute of Public Administration, Karachi, and the Planning Commission, Government of Pakistan which was held in March 1966.

21. More Conferences

The Conference is of the opinion that the Conference was a useful forum for a fruitful discussion concerning problems of urbanization. We hereby recommend that subsequent conferences be scheduled and suggest the following possible topics:

(a) Problems of Urban Local Government Organization and Management,

(b) Financing Urban Government,

(c) Economic and Social Problems of Urbanization,

(d) Urban Functional areas including health, education, air-pollution, social welfare, and recreation,

(e) Manpower Development in urban areas, and

(f) Education and training for urban, physical planning.

The Conference further recommends that seminars be held for professionals employed in municipal governments, including the chairmen and professional personnel of municipal corporations and municipalities, elected members of local bodies and executives of cantonments.

Select Bibliography on Problems of Urbanization

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OUTLINE

1. Causes and Consequences of Accelerated Urbanization
2. Organizations for Urban Administration
   (a) Government and Local Bodies
   (b) Functional Organization
      (i) Planning
      (ii) Transportation
3. Financing Urban Development
4. Urbanization in Developing Countries
5. Research Methodology
6. Bibliographies

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